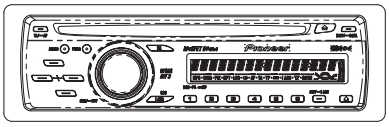
Pioneer *sound.vision.soul*

Service Manual



DEH-P4800MP/XU/EW

ORDER NO.
CRT3558

MULTI-CD CONTROL HIGH POWER CD/MP3/WMA PLAYER WITH RDS TUNER

DEH-P4800MP/XU/EW

This service manual should be used together with the following manual(s):

Model No.	Order No.	Mech.Module	Remarks
CX-3164	CRT3583	S10.5COMP1	CD Mech. Module : Circuit Descriptions, Mech. Descriptions, Disassembly

For details, refer to "Important Check Points for Good Servicing".

PIONEER CORPORATION 4-1, Meguro 1-chome, Meguro-ku, Tokyo 153-8654, Japan
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ⓒ**PIONEER CORPORATION 2005**

K-ZZA. DEC. 2005 Printed in Japan

SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer.
Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty.
If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

● Safety Precautions for those who Service this Unit.

- **When checking or adjusting the emitting power of the laser diode exercise caution in order to get safe, reliable results.**

Caution:

1. **During repair or tests, minimum distance of 13cm from the focus lens must be kept.**
2. **During repair or tests, do not view laser beam for 10 seconds or longer.**

● CD Section Precaution

1. You should conform to the regulations governing the product (safety, radio and noise, and other regulations), and should keep the safety during servicing by following the safety instructions described in this manual.
2. Before disassembling the unit, be sure to turn off the power. Unplugging and plugging the connectors during power-on mode may damage the ICs inside the unit.
3. To protect the pickup unit from electrostatic discharge during servicing, take an appropriate treatment (shorting-solder) by referring to "the DISASSEMBLY".
4. After replacing the pickup unit, be sure to check the grating.

COMPACT disc DIGITAL AUDIO

COMPACT disc DIGITAL AUDIO TEXT

Plays Windows Media™

[Important Check Points for Good Servicing]

In this manual, procedures that must be performed during repairs are marked with the below symbol.
Please be sure to confirm and follow these procedures.

1. Product safety

Please conform to product regulations (such as safety and radiation regulations), and maintain a safe servicing environment by following the safety instructions described in this manual.

① Use specified parts for repair.

Use genuine parts. Be sure to use important parts for safety.

② Do not perform modifications without proper instructions.

Please follow the specified safety methods when modification(addition/change of parts) is required due to interferences such as radio/TV interference and foreign noise.

③ Make sure the soldering of repaired locations is properly performed.

When you solder while repairing, please be sure that there are no cold solder and other debris.
Soldering should be finished with the proper quantity. (Refer to the example)

④ Make sure the screws are tightly fastened.

Please be sure that all screws are fastened, and that there are no loose screws.

⑤ Make sure each connectors are correctly inserted.

Please be sure that all connectors are inserted, and that there are no imperfect insertion.

⑥ Make sure the wiring cables are set to their original state.

Please replace the wiring and cables to the original state after repairs.
In addition, be sure that there are no pinched wires, etc.

⑦ Make sure screws and soldering scraps do not remain inside the product.

Please check that neither solder debris nor screws remain inside the product.

⑧ There should be no semi-broken wires, scratches, melting, etc. on the coating of the power cord.

Damaged power cords may lead to fire accidents, so please be sure that there are no damages.
If you find a damaged power cord, please exchange it with a suitable one.

⑨ There should be no spark traces or similar marks on the power plug.

When spark traces or similar marks are found on the power supply plug, please check the connection and advise on secure connections and suitable usage. Please exchange the power cord if necessary.

⑩ Safe environment should be secured during servicing.

When you perform repairs, please pay attention to static electricity, furniture, household articles, etc. in order to prevent injuries.
Please pay attention to your surroundings and repair safely.

2. Adjustments

To keep the original performance of the products, optimum adjustments and confirmation of characteristics within specification.
Adjustments should be performed in accordance with the procedures/instructions described in this manual.

3. Lubricants, Glues, and Replacement parts

Use grease and adhesives that are equal to the specified substance.
Make sure the proper amount is applied.

4. Cleaning

For parts that require cleaning, such as optical pickups, tape deck heads, lenses and mirrors used in projection monitors, proper cleaning should be performed to restore their performances.

5. Shipping mode and Shipping screws

To protect products from damages or failures during transit, the shipping mode should be set or the shipping screws should be installed before shipment. Please be sure to follow this method especially if it is specified in this manual.

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1. SPECIFICATIONS

General

Power source ..... 14.4 V DC (10.8 – 15.1 V allowable)
Grounding system ..... Negative type
Max. current consumption ..... 10.0 A
Backup current ..... 5 mA or less
Dimensions (W × H × D):
- DIN
  - Chassis ..... 178 × 50 × 157 mm
  - Nose ..... 188 × 58 × 19 mm
- D
  - Chassis ..... 178 × 50 × 162 mm
  - Nose ..... 170 × 48 × 14 mm

Weight ..... 1.3 kg

Audio

Maximum power output ..... 50 W × 4
50 W × 2/4 Ω + 70 W × 1/2 Ω (for subwoofer)
Continuous power output ... 27 W × 4 (DIN 45324, +B=14.4 V)
Load impedance ..... 4 – 8 Ω × 4
4 – 8 Ω × 2 + 2 Ω × 1
Preout max output level/output impedance ..... 2.2 V/1 kΩ
Equalizer (3-Band Parametric Equalizer):
- Low
  - Frequency ..... 40/80/100/160 Hz
  - Q Factor ..... 0.35/0.59/0.95/1.15 (+6 dB when boosted)
  - Gain ..... ±12dB
- Mid
  - Frequency ..... 200/500/1k/2k Hz
  - Q Factor ..... 0.35/0.59/0.95/1.15 (+6 dB when boosted)
  - Gain ..... ±12dB
- High
  - Frequency ..... 3.15k/8k/10k/12.5k Hz
  - Q Factor ..... 0.35/0.59/0.95/1.15 (+6 dB when boosted)
  - Gain ..... ±12dB

Loudness contour:
- Low ..... +3.5 dB (100 Hz), +3 dB (10 kHz)
- Mid ..... +10 dB (100 Hz), +6.5 dB (10 kHz)
- High ..... +11 dB (100 Hz), +11 dB (10 kHz) (volume: –30 dB)

HPF:
- Frequency ..... 50/63/80/100/125 Hz
- Slope ..... –12 dB/oct

Subwoofer:
- Frequency ..... 50/63/80/100/125 Hz
- Slope ..... –18 dB/oct
- Gain ..... +6 – –24 dB
- Phase ..... Normal/Reverse

Bass boost:
- Gain ..... +12 – 0 dB

CD player

System ..... Compact disc audio system
Usable discs ..... Compact disc
Signal format:
- Sampling frequency ..... 44.1 kHz
- Number of quantization bits ..... 16; linear

Frequency characteristics ... 5 – 20 000 Hz (±1 dB)
Signal-to-noise ratio ..... 94 dB (1 kHz) (IEC-A network)
Dynamic range ..... 92 dB (1 kHz)
Number of channels ..... 2 (stereo)
MP3 decoding format ..... MPEG-1 & 2 Audio Layer 3
WMA decoding format ..... Ver. 7, 7.1, 8, 9, 10 (2ch audio) (Windows Media Player)
WAV signal format ..... Linear PCM & MS ADPCM

FM tuner

Frequency range ..... 87.5 – 108.0 MHz
Usable sensitivity ..... 8 dBf (0.7 μV/75 Ω, mono, S/N: 30 dB)
50 dB quieting sensitivity ..... 10 dBf (0.9 μV/75 Ω, mono)
Signal-to-noise ratio ..... 75 dB (IEC-A network)
Distortion ..... 0.3 % (at 65 dBf, 1 kHz, stereo) 0.1 % (at 65 dBf, 1 kHz, mono)
Frequency response ..... 30 – 15 000 Hz (±3 dB)
Stereo separation ..... 45 dB (at 65 dBf, 1 kHz)
Selectivity ..... 80 dB (±200 kHz)

MW tuner

Frequency range ..... 531 – 1 602 kHz (9 kHz)
Usable sensitivity ..... 18 μV (S/N: 20 dB)
Signal-to-noise ratio ..... 65 dB (IEC-A network)

LW tuner

Frequency range ..... 153 – 281 kHz
Usable sensitivity ..... 30 μV (S/N: 20 dB)
Signal-to-noise ratio ..... 65 dB (IEC-A network)

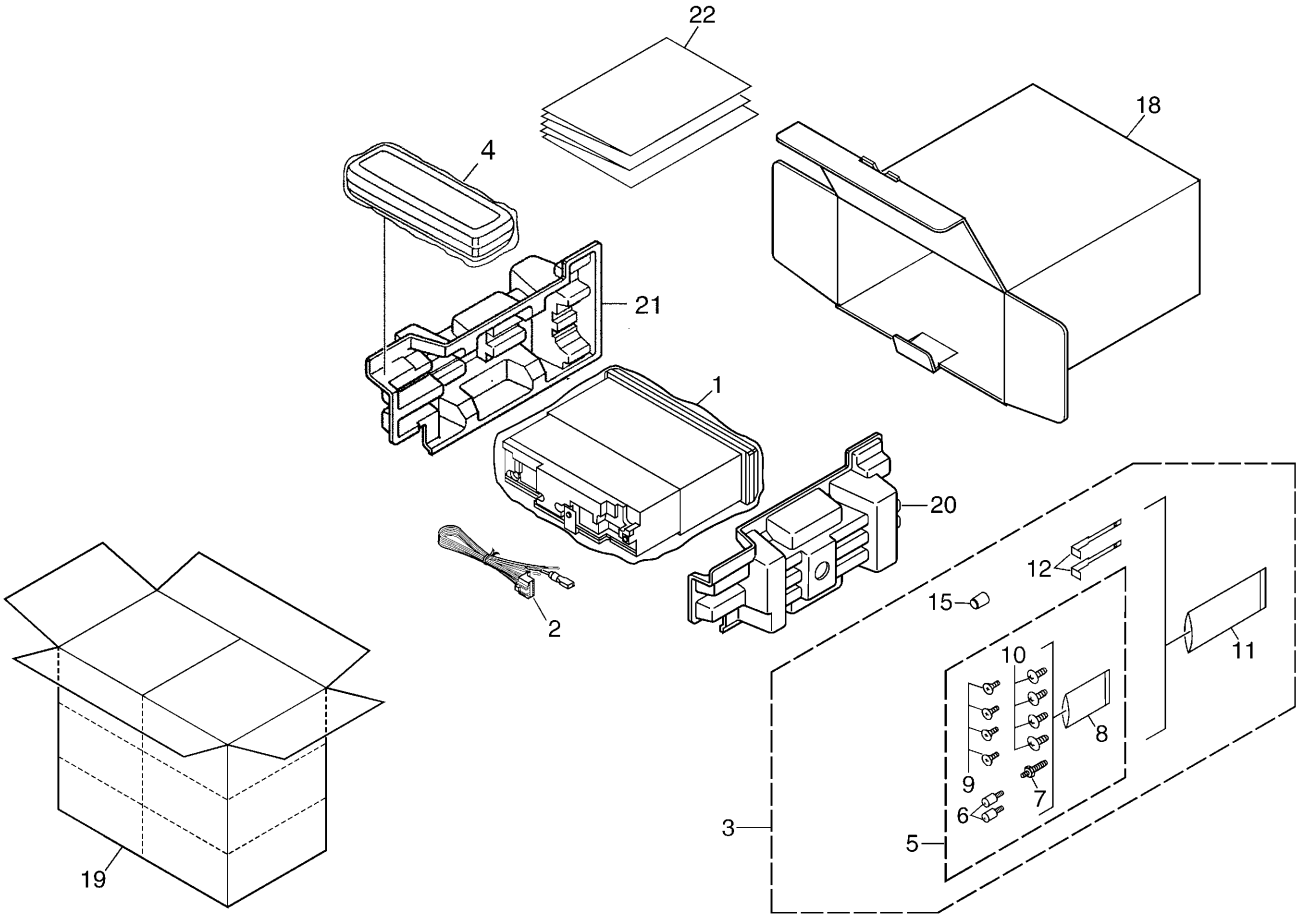
Note

Specifications and the design are subject to possible modifications without notice due to improvements. ▣

2. EXPLODED VIEWS AND PARTS LIST

*NOTES : • Parts marked by " * " are generally unavailable because they are not in our Master Spare Parts List.*
• The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
• Screw adjacent to▽mark on the product are used for disassembly.
• For the applying amount of lubricants or glue, follow the instructions in this manual. (In the case of no amount instructions,apply as you think it appropriate.)

2.1 PACKING



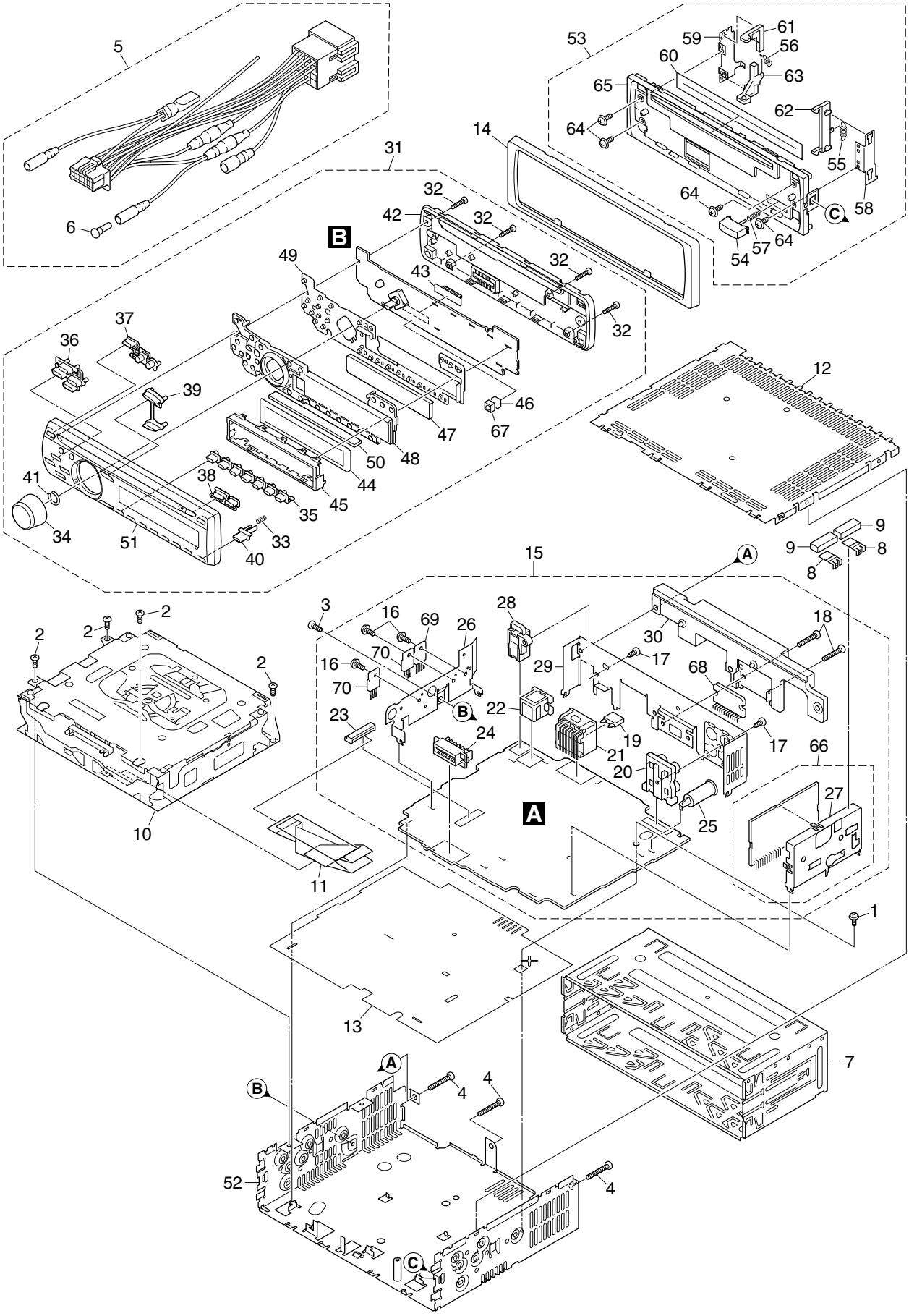
PACKING SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	Polyethylene Bag	CEG-162
	2	Cord Assy	CDE7059
	3	Accessory Assy	CEA4610
	4	Case Assy	CXB3520
	5	Screw Assy	CEA6002
	6	Fixing Screw(M2 x 4)	CBA1994
	7	Screw	CBA1650
*	8	Polyethylene Bag	CEG-127
	9	Screw	CRZ50P090FTC
	10	Screw	TRZ50P080FTC
*	11	Polyethylene Bag	CEG-158
	12	Handle	CNC5395
	13	•••••	
	14	•••••	
	15	Bush	CNV3930
	16	•••••	
	17	•••••	
	18	Carton	YHG5050
	19	Contain Box	YHL5050
	20	Protector	YHP5008
	21	Protector	YHP5009
	22-1	Owner's Manual	YRD5046
	22-2	Owner's Manual	YRD5047
	22-3	Owner's Manual	YRD5048
	22-4	Installation Manual	YRD5049
*	22-5	Passport	CRY1013
*	22-6	Warranty Card	CRY1157

Owner's Manual,Installation Manual

Part No.	Language
YRD5046	English,Spanish
YRD5047	German,French
YRD5048	Italian,Dutch,Russian
YRD5049	English,Spanish,German,French,Italian,Dutch,Russian

2.2 EXTERIOR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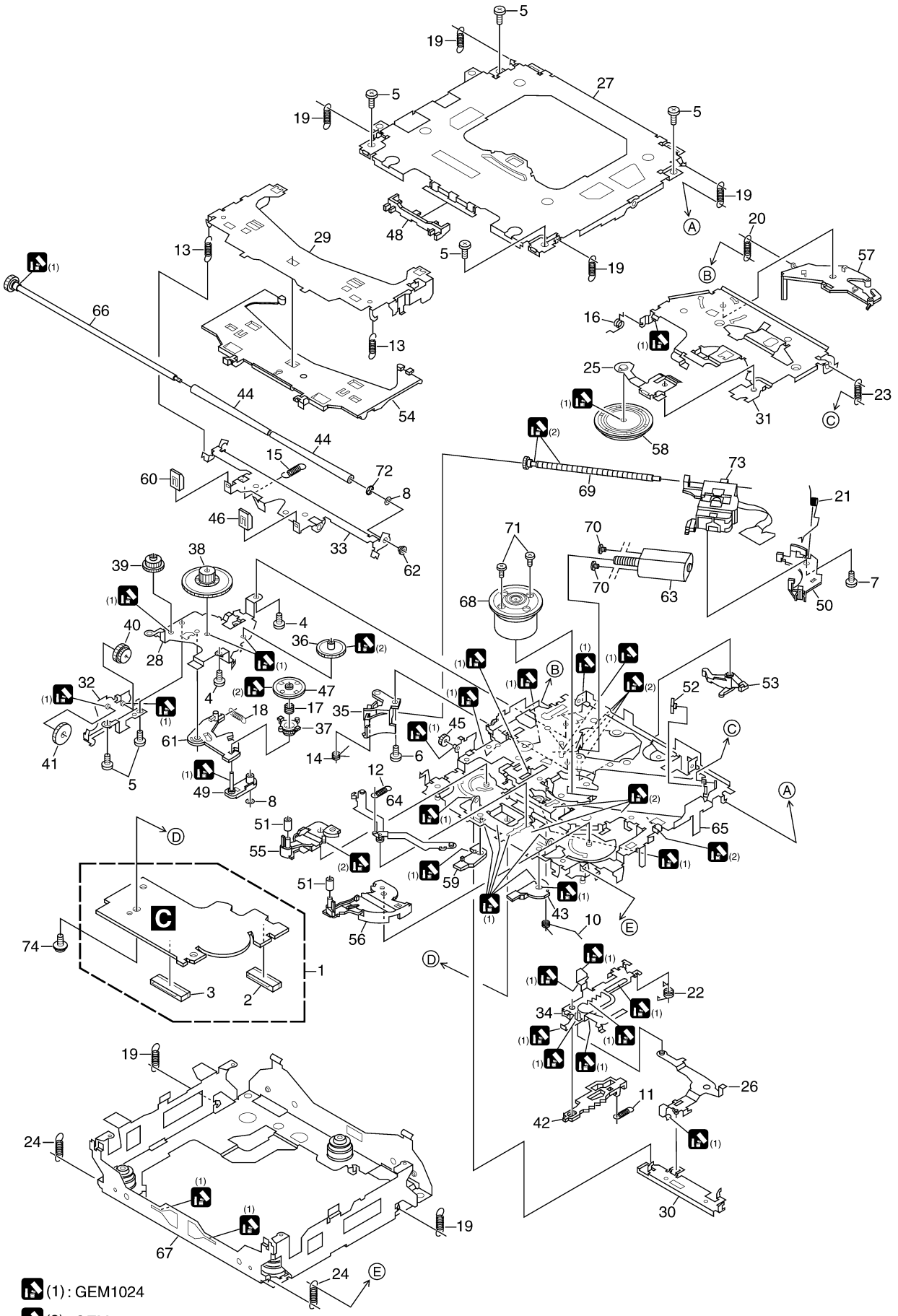
EXTERIOR SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	Screw	ASZ26P050FTC
	2	Screw	BSZ26P060FTC
	3	Screw	BSZ30P060FTC
	4	Screw	BSZ30P200FTC
	5	Cord Assy	CDE7059
	6	Cap	CKX-003
	7	Holder	CNC8659
	8	Earth Plate	CNC8915
	9	Cushion	CNM8890
	10	CD Mechanism Module(S10.5)	CXK5750
	11	Cable	YDE5013
	12	Case	YNB5008
	13	Insulator	YNM5012
	14	Panel	YNS5105
	15	Tuner Amp Unit	YWM5101
	16	Screw	ASZ26P060FTC
	17	Screw	BPZ26P080FTC
	18	Screw	BSZ26P160FTC
⚠	19	Fuse(10 A)	CEK1208
	20	Pin Jack(CN353)	CKB1051
	21	Plug(CN901)	CKM1376
	22	Connector(CN101)	CKS3408
	23	Connector(CN701)	CKS3834
	24	Connector(CN803)	CKS4944
	25	Antenna Jack(CN401)	CKX1056
	26	Holder	CND1328
	27	Holder	CND1054
	28	Jack(CN621)	YKS5001
	29	Holder	YNC5018
	30	Heat Sink	YNR5004
	31	Detachable Assy	YXA5111
	32	Screw	BPZ20P100FTB
	33	Spring	CBH2210
	34	Knob(SOURCE,VOLUME)	YAA5005
	35	Button(1-6,SW)	YAC5059
	36	Button(UP,DOWN,LEFT,RIGHT)	YAC5060
	37	Button(TA,AUDIO,FUNCTION)	YAC5061
	38	Button(EJECT,DISPLAY)	YAC5062
	39	Button(EQ,BAND)	YAC5063
	40	Button(DETACH)	YAC5071
	41	Spring	YBH5003
	42	Cover	YNS5103
	43	Connector(CN1801)	CKS4943
	44	LCD(LCD1801)	YAW5054
	45	Holder	YNC5012
	46	Cushion	YNM5029
	47	Lighting Conductor	YNV5024
	48	Lighting Conductor	YNV5025
	49	Rubber	YNV5026
	50	Connector	YNV5033
	51	Grille Unit	YXA5146
	52	Chassis Unit	YXA5151
	53	Panel Unit	YXA5154
	54	Button(DETACH)	CAC4836
	55	Spring	CBH1835
	56	Spring	CBH2208
	57	Spring	CBH2367
	58	Bracket	CNC6791
*	59	Holder	CNC8042
	60	Cover	CNM6276
	61	Arm	CNV4692
	62	Arm	CNV4728
*	63	Arm	CNV5576
	64	Screw	IMS20P030FTB
*	65	Panel	YNS5046
	66	FM/AM Tuner Unit	CWE1951
	67	IC(IC1802)	TSOP4840SB1
	68	IC(IC301)	PAL007B
	69	IC(IC921)	NJM2388F84
	70	Transistor(Q911, 702)	2SD2396

2.3 CD MECHANISM MODULE

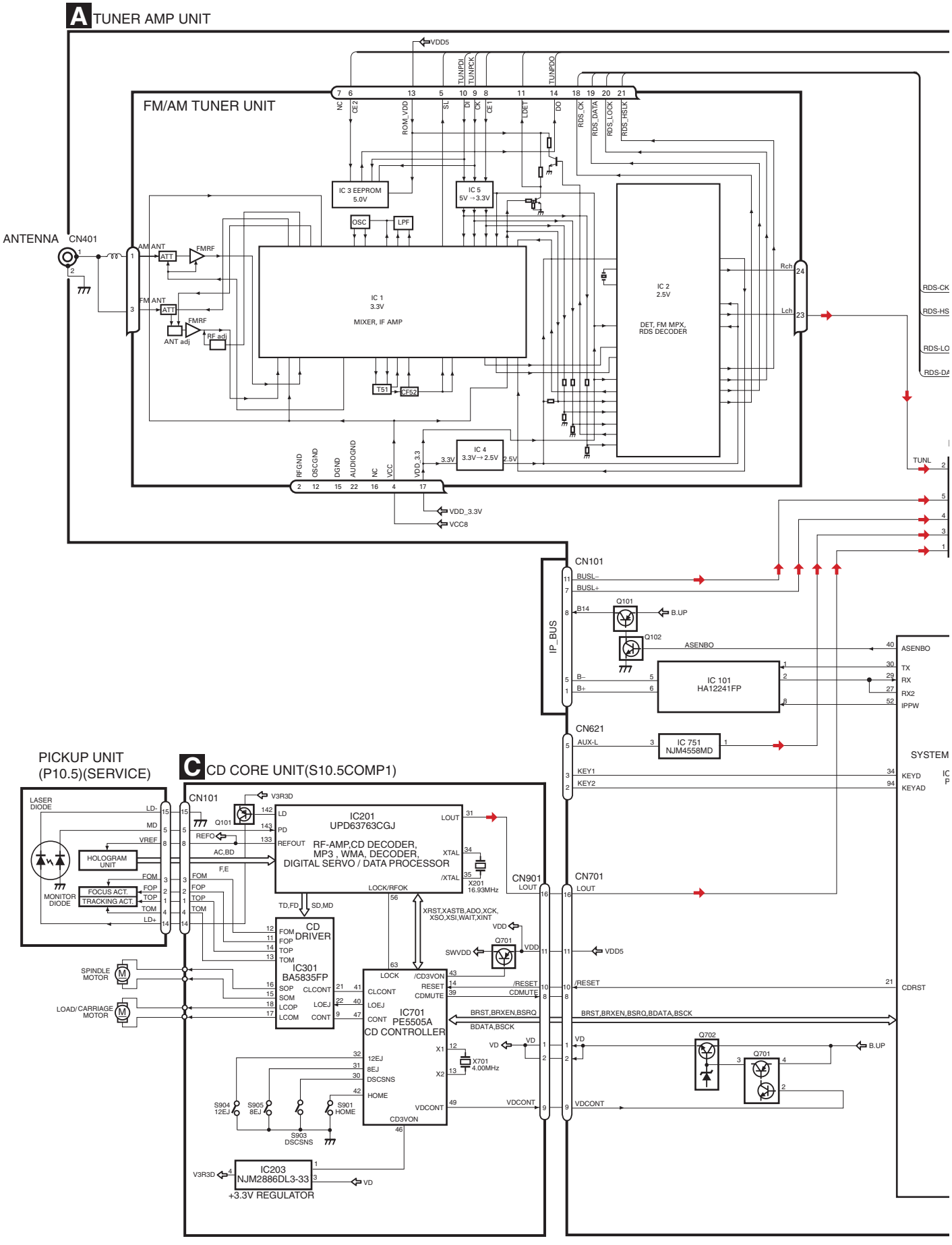


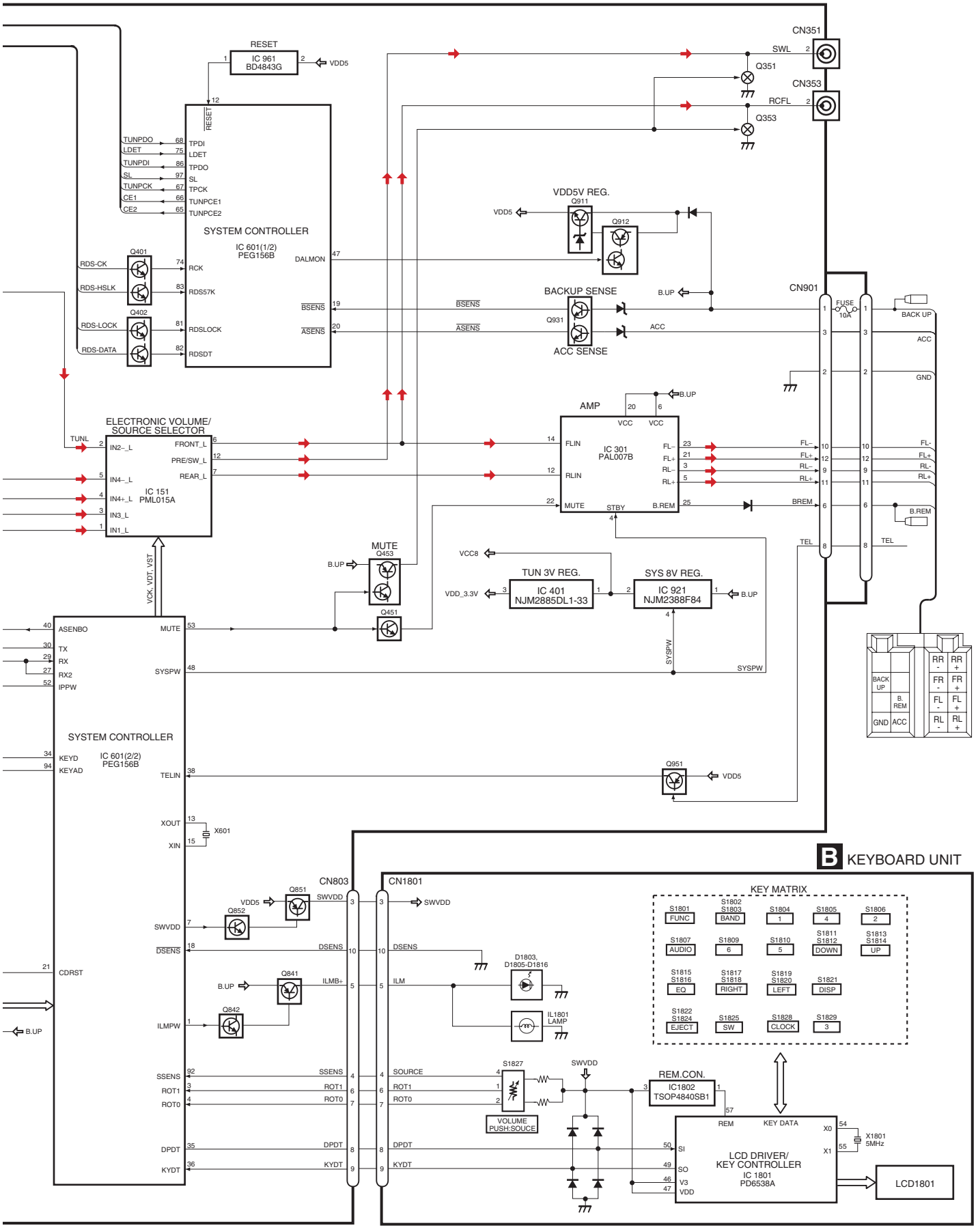
CD MECHANISM MODULE SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	CD Core Unit(S10.5COMP1)	CWX3176
	2	Connector(CN101)	CKS4808
	3	Connector(CN901)	CKS5284
	4	Screw	BMZ20P025FTC
	5	Screw	BSZ20P040FTC
	6	Screw(M2 x 3)	CBA1511
	7	Screw(M2 x 4)	CBA1835
	8	Washer	CBF1038
	9	•••••	
	10	Spring	CBH2609
	11	Spring	CBH2612
	12	Spring	CBH2614
	13	Spring	CBH2616
	14	Spring	CBH2617
	15	Spring	CBH2620
	16	Spring	CBH2855
	17	Spring	CBH2937
	18	Spring	CBH2735
	19	Spring	CBH2854
	20	Spring	CBH2642
	21	Spring	CBH2856
	22	Spring	CBH2857
	23	Spring	CBH2860
	24	Spring	CBH2861
	25	Spring	CBL1686
	26	Arm	CND1909
	27	Frame	CND2582
	28	Bracket	CND2583
	29	Arm	CND2584
	30	Lever	CND2585
	31	Arm	CND2586
	32	Bracket	CND2587
	33	Arm	CND2588
	34	Lever	CND2589
	35	Holder	CNV7201
	36	Gear	CNV7207
	37	Gear	CNV7208
	38	Gear	CNV7209
	39	Gear	CNV7210
	40	Gear	CNV7211
	41	Gear	CNV7212
	42	Rack	CNV7214
	43	Arm	CNV7216
	44	Roller	CNV8189
	45	Gear	CNV7219
	46	Guide	CNV7361
	47	Gear	CNV7595
	48	Guide	CNV8448
	49	Arm	CNV7805
	50	Rack	CNV8342
	51	Roller	CNV8343
	52	Holder	CNV8344
	53	Arm	CNV8345
	54	Guide	CNV8347
	55	Arm	CNV8348
	56	Arm	CNV8349
	57	Arm	CNV8350
	58	Clamper	CNV8365
	59	Arm	CNV8386
	60	Guide	CNV8396
	61	Arm	CNV8413
	62	Collar	CNV8447
	63	Motor Unit(M2)	CXC4026
	64	Arm Unit	CXC4027
	65	Chassis Unit	CXC4028
	66	Gear Unit	CXC4029
	67	Frame Unit	CXC4031
	68	Motor Unit(M1)	CXC6742
	69	Screw Unit	CXC6359
	70	Screw	JFZ20P020FTC
	71	Screw	JGZ17P022FTC
	72	Washer	YE20FTC
	73	Pickup Unit(P10.5)(Service)	CXX1942
	74	Screw	IMS26P030FTC

3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

3.1 BLOCK DIAGRAM




RESET
IC 961
BD4843G
VDD5
CN351
SWL
Q351
CN353
RCFL
Q353
SYSTEM CONTROLLER
IC 601(1/2)
PEG156B
TUNPDO
LDET
TUNPDI
SL
TUNPCK
CE1
CE2
TPDI
LDET
TPDO
SL
TPCK
TUNPCE1
TUNPCE2
RESET
DALMON
BSENS
ASENS
RCK
RDS57K
RDSLOCK
RDSDT
RDS-CK
RDS-HSLK
RDS-LOCK
RDS-DATA
Q401
Q402
VDD5V REG.
Q911
Q912
VDD5
BACKUP SENSE
Q931
ACC SENSE
B.UP
ACC
CN901
FUSE
10A
BACK UP
ACC
GND
ELECTRONIC VOLUME/
SOURCE SELECTOR
IC 151
PML015A
TUNL
IN2-_L
IN4-_L
IN4+_L
IN3_L
IN1_L
FRONT_L
PRE/SW_L
REAR_L
AMP
IC 301
PAL007B
VCC
FLIN
RLIN
MUTE
STBY
B.REM
FL-
FL+
RL-
RL+
BREM
B.REM
TEL
MUTE
Q453
Q451
VCK, VDT, VST
TUN 3V REG.
IC 401
NJM2885DL1-33
VDD_3.3V
VCC8
SYS 8V REG.
IC 921
NJM2388F84
SYSPW
Q951
SYSTEM CONTROLLER
IC 601(2/2)
PEG156B
ASENBO
TX
RX
RX2
IPPW
KEYD
KEYAD
CDRST
TELIN
XOUT
XIN
X601
B.UP
RR -
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FL -
FL +
RL -
RL +
BACK UP
B. REM
GND
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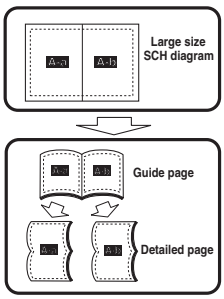
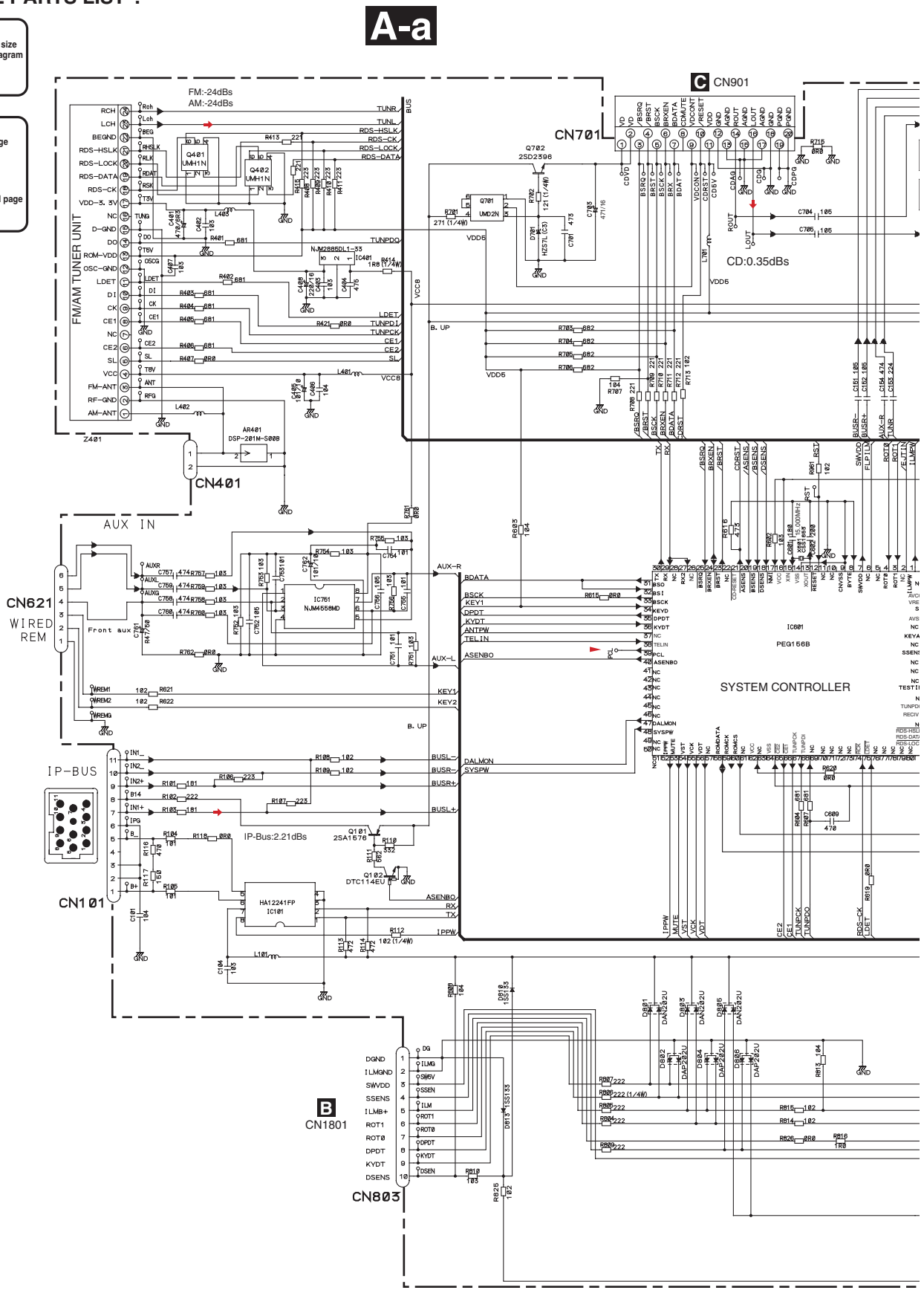
CN803
CN1801
SWVDD
DSENS
ILMB+
ILMPW
SSENS
ROT1
ROT0
DPDT
KYDT
Q851
Q852
Q841
Q842
D1803,
D1805-D1816
IL1801
LAMP
ILM
SOURCE
S1827
VOLUME
PUSH:SOUCE
REM.CON.
IC1802
TSOP4840SB1
KEY MATRIX
S1801 FUNC
S1802 S1803 BAND
S1804 1
S1805 4
S1806 2
S1807 AUDIO
S1809 6
S1810 5
S1811 S1812 DOWN
S1813 S1814 UP
S1815 S1816 EQ
S1817 S1818 RIGHT
S1819 S1820 LEFT
S1821 DISP
S1822 S1824 EJECT
S1825 SW
S1828 CLOCK
S1829 3
REM
KEY DATA
LCD DRIVER/
KEY CONTROLLER
IC 1801
PD6538A
X1801
5MHz
LCD1801

3.2 OVERALL CONNECTION DIAGRAM(GUIDE PAGE)

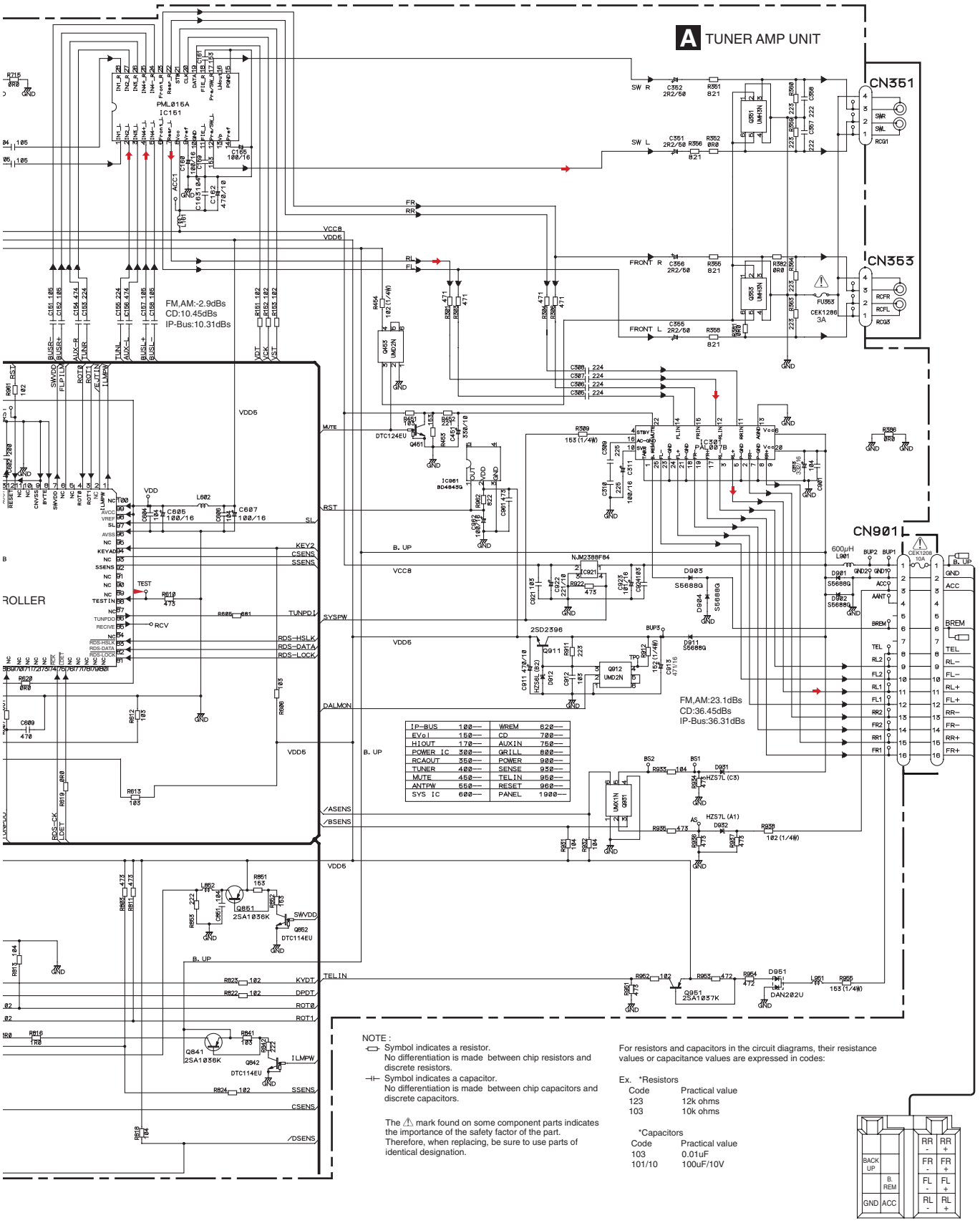
Note: When ordering service parts, be sure to refer to " EXPLODED VIEWS AND PARTS LIST" or "ELECTRICAL PARTS LIST".





A-b

A TUNER AMP UNIT



NOTE :

- Symbol indicates a resistor. No differentiation is made between chip resistors and discrete resistors.
- Symbol indicates a capacitor. No differentiation is made between chip capacitors and discrete capacitors.

The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

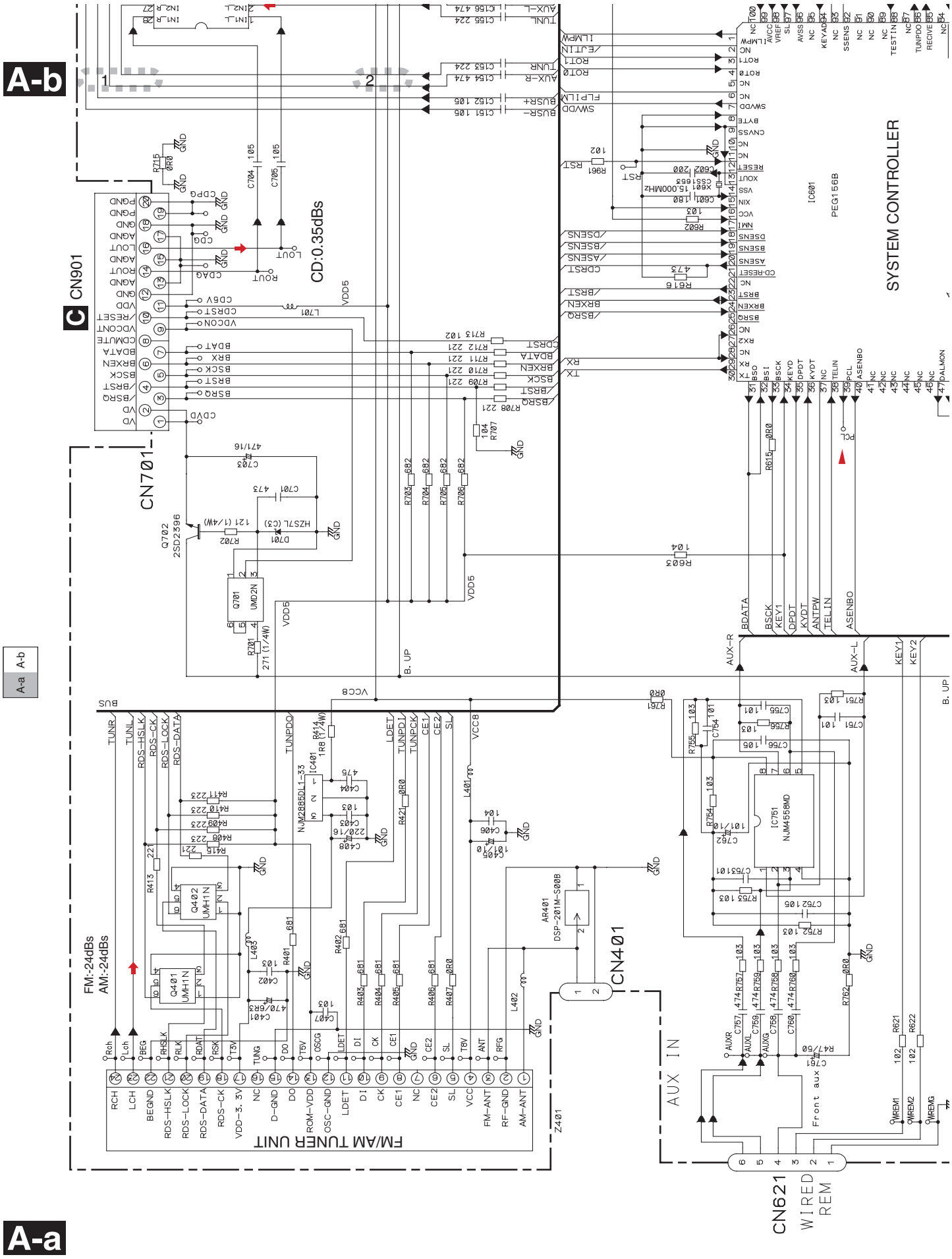
For resistors and capacitors in the circuit diagrams, their resistance values or capacitance values are expressed in codes:

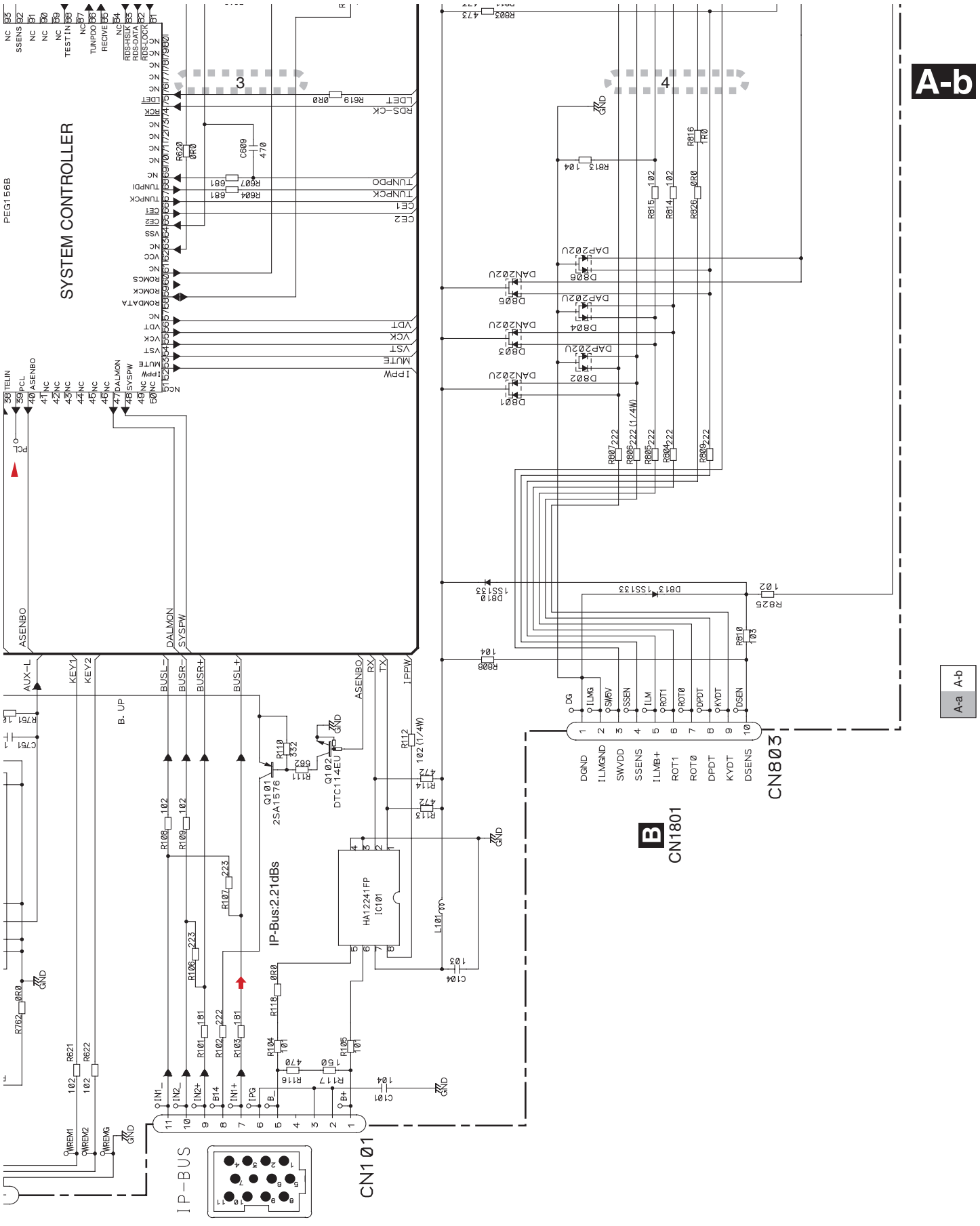
Ex. *Resistors

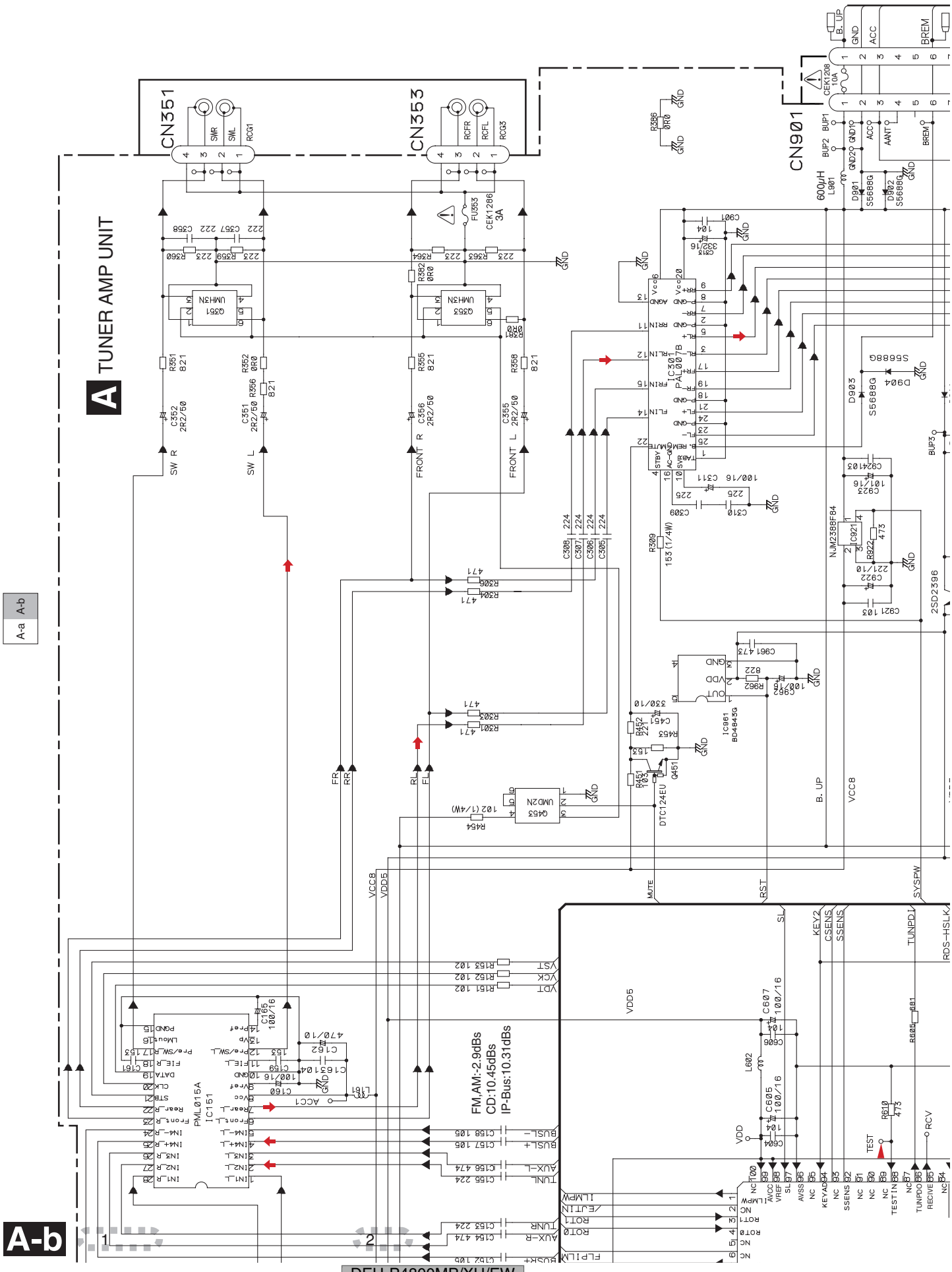
Code	Practical value
123	12k ohms
103	10k ohms

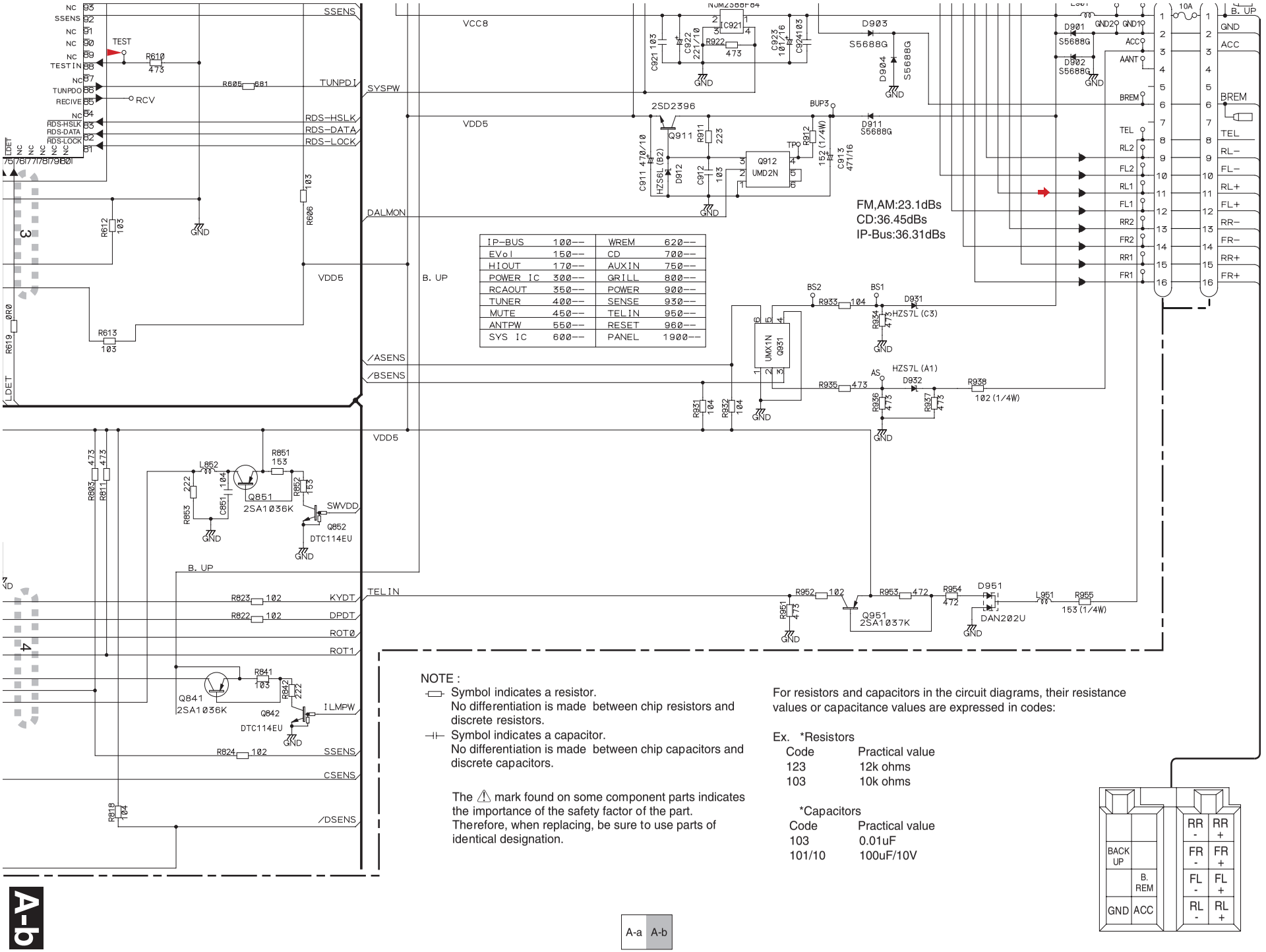
*Capacitors

Code	Practical value
103	0.01uF
101/10	100uF/10V

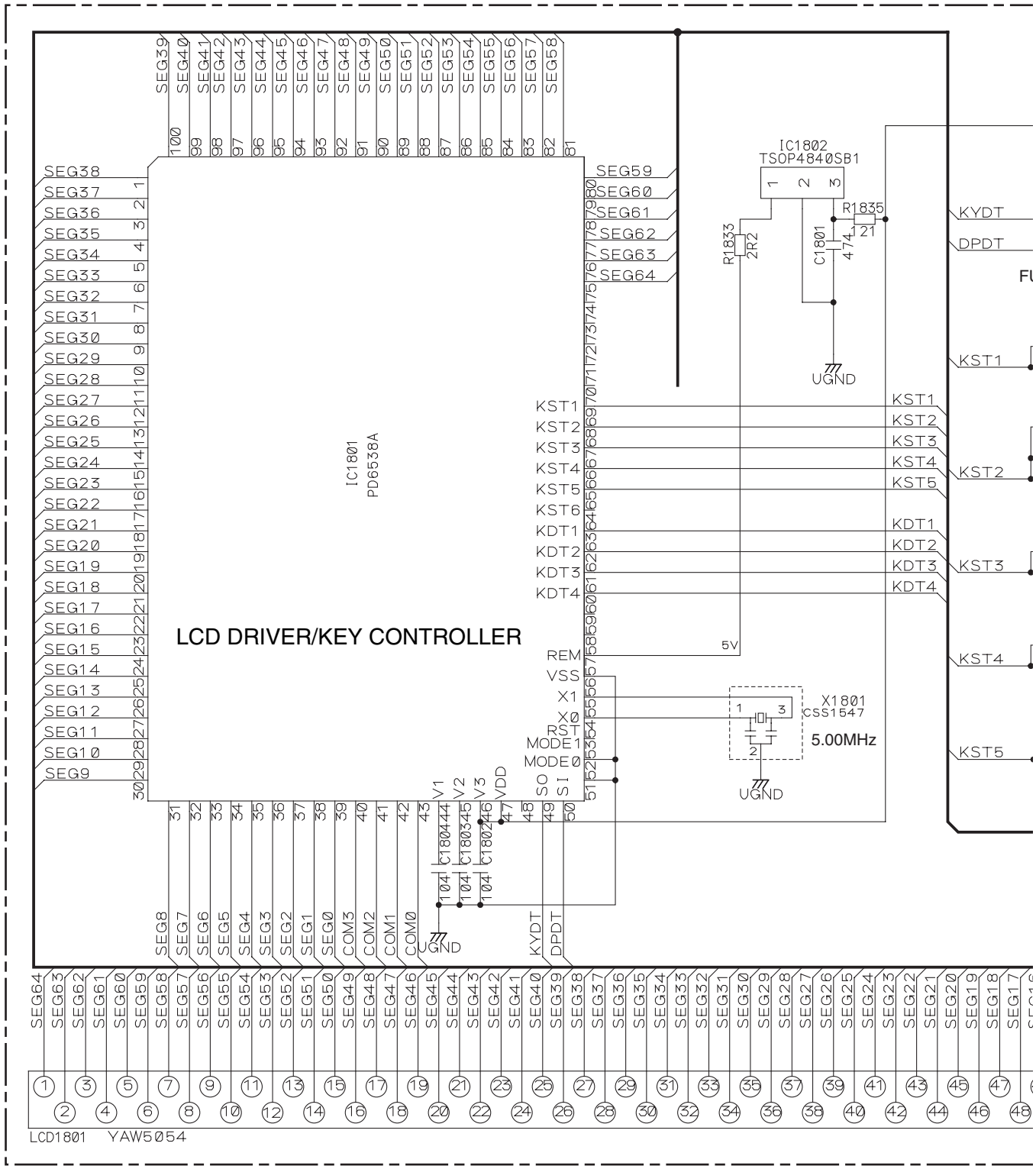

A-b
A-a
SYSTEM CONTROLLER
PEG156B
IC601
CD:0.35dBs
CN901
CN701
CN401
CN621
WIRED REM
AUX IN
FM/AM TUNER UNIT
Z401
FM:-24dBs
AM:-24dBs
Front aux
NJM2885DL1-33
NJM4558MD
DSP-201M-S00B
BUS
VCC8
VDD5
B. UP
BDATA
BSCK
KEY1
DPDT
KYDT
ANTPW
TELIN
ASENBO
AUX-R
AUX-L
KEY2
TUNR
TUNL
RDS-HSLK
RDS-CK
RDS-LOCK
RDS-DATA
TUNPDO
LDET
TUNPDI
TUNPCK
CE1
CE2
SL
VCC8

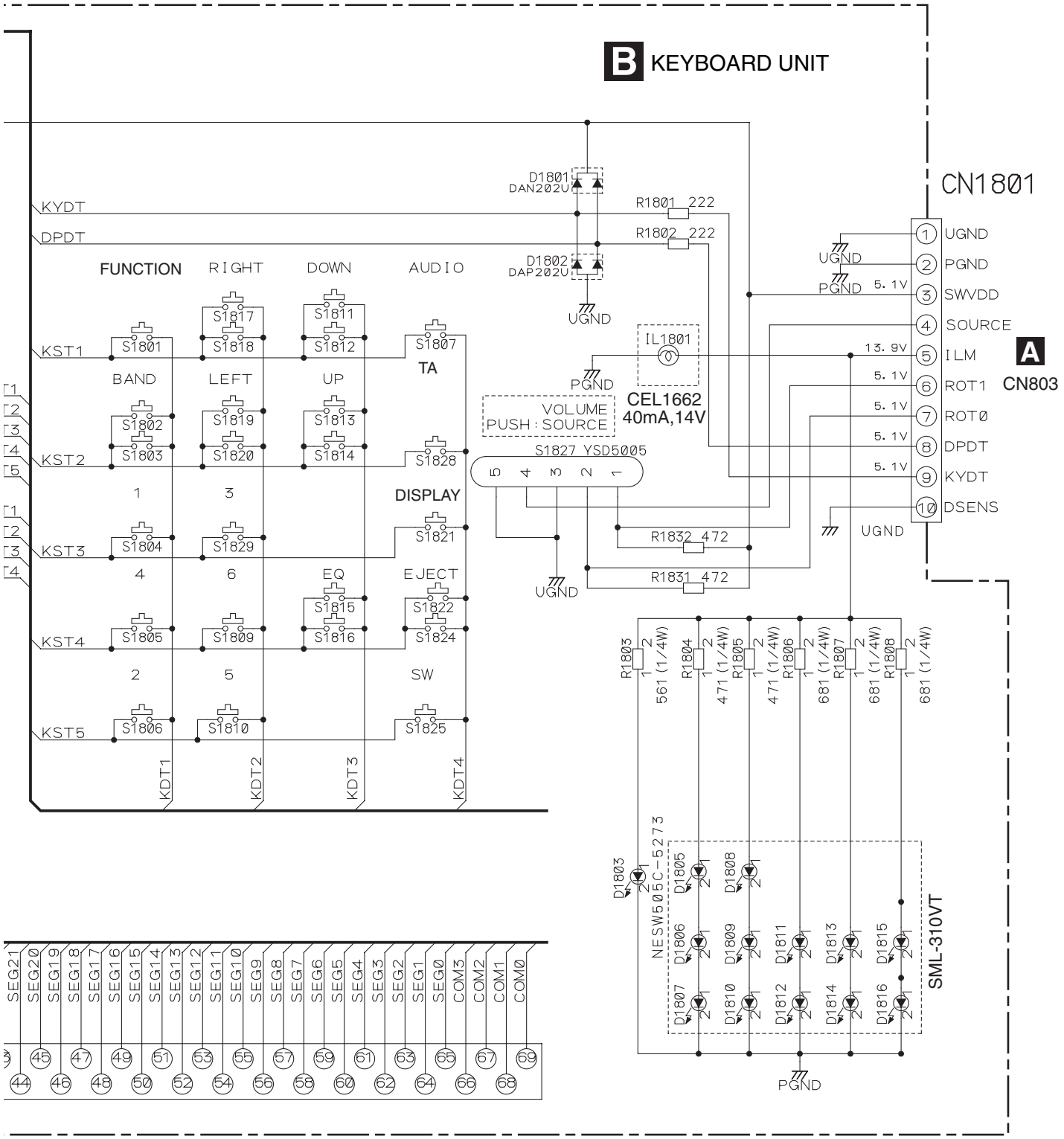

SYSTEM CONTROLLER
PEG156B
CN1801
CN803
CN101
IP-BUS
HA12241FP
IC101
IP-Bus:2.21dBs
A-b
A-a


A TUNER AMP UNIT
CN351
CN353
CN901
IC301 PAL007B
IC961 BD4843G
NJM2388F84
2SD2396
PML015A IC151
FM:AM:-2.9dBs
CD:10.45dBs
IP-Bus:10.31dBs
A-b
A-a
DEH-P4800MP/XU/EW


DEH-P4800MP/XU/EW
A-b
A-a
SSENS
TUNPDI
SYSPW
RDS-HSLK
RDS-DATA
RDS-LOCK
DALMON
VDD5
B. UP
/ASENS
/BSENS
SWVDD
KYDT
DPDT
ROT0
ROT1
ILMPW
CSENS
/DSENS
TELIN
RCV
TEST
2SA1036K
DTC114EU
2SA1037K
DAN202U
2SD2396
UMD2N
UMX1N
HZS7L (C3)
HZS7L (A1)
S5688G
FM,AM:23.1dBs
CD:36.45dBs
IP-Bus:36.31dBs
IP-BUS 100--
EVol 150--
HIOUT 170--
POWER IC 300--
RCAOUT 350--
TUNER 400--
MUTE 450--
ANTPW 550--
SYS IC 600--
WREM 620--
CD 700--
AUXIN 750--
GRILL 800--
POWER 900--
SENSE 930--
TELIN 950--
RESET 960--
PANEL 1900--
NOTE :
Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.
Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part.
Therefore, when replacing, be sure to use parts of identical designation.
For resistors and capacitors in the circuit diagrams, their resistance values or capacitance values are expressed in codes:
Ex. *Resistors
Code Practical value
123 12k ohms
103 10k ohms
*Capacitors
Code Practical value
103 0.01uF
101/10 100uF/10V
BACK UP
B. REM
GND
ACC
RR -
RR +
FR -
FR +
FL -
FL +
RL -
RL +

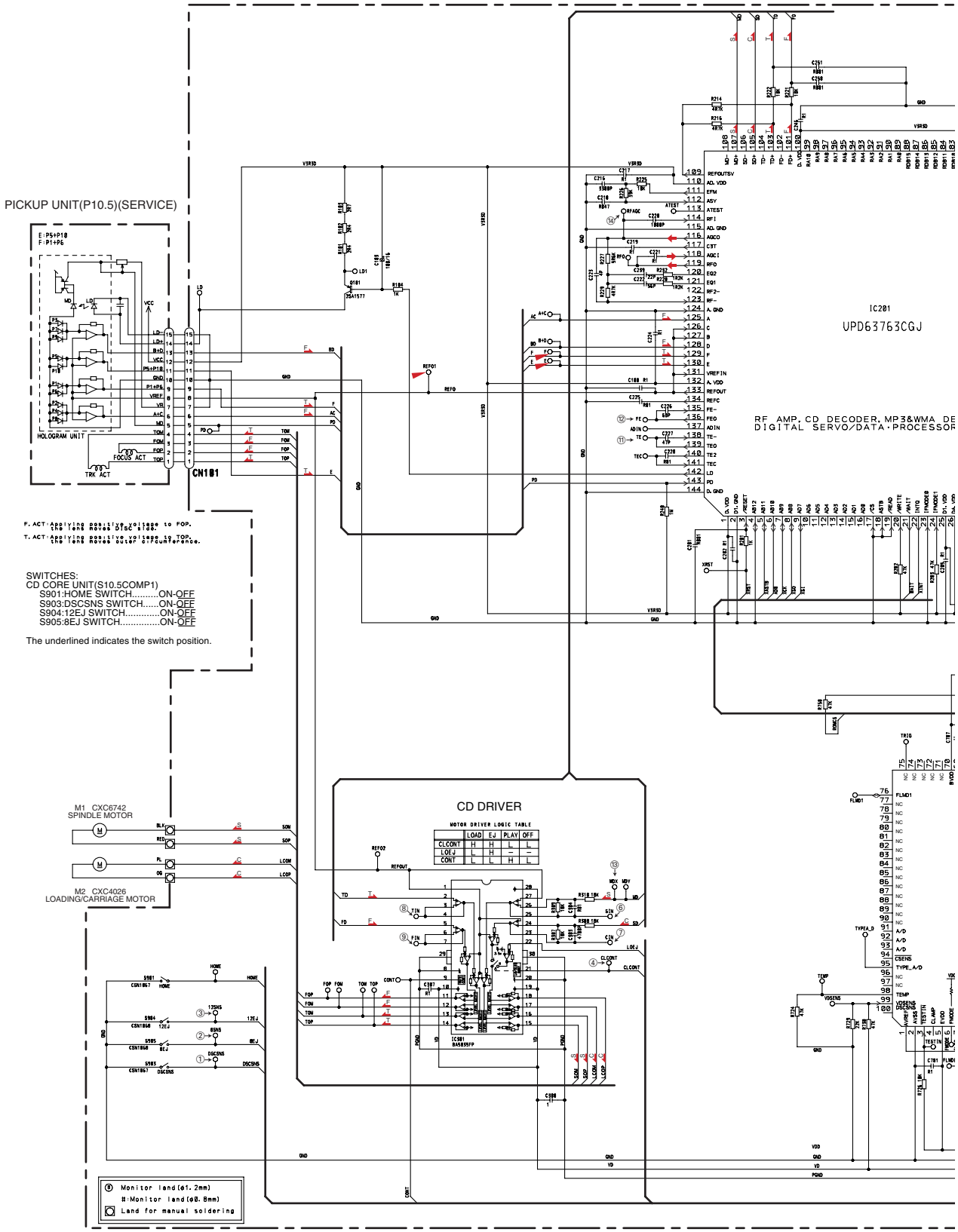
3.3 KEYBOARD UNIT




B KEYBOARD UNIT
CN1801
D1801 DAN202U
D1802 DAP202U
R1801 222
R1802 222
KYDT
DPDT
UGND
PGND
5.1V
SWVDD
SOURCE
13.9V
ILM
ROT1
ROT0
DPDT
KYDT
DSENS
A
CN803
IL1801
CEL1662
40mA,14V
VOLUME
PUSH : SOURCE
S1827 YSD5005
R1832 472
R1831 472
FUNCTION
RIGHT
DOWN
AUDIO
KST1
KST2
KST3
KST4
KST5
S1801
S1817
S1811
S1807
BAND
LEFT
UP
TA
S1802
S1803
S1819
S1820
S1813
S1814
S1828
1
3
DISPLAY
S1804
S1829
S1821
4
6
EQ
EJECT
S1815
S1816
S1822
S1824
S1805
S1809
2
5
SW
S1806
S1810
S1825
KDT1
KDT2
KDT3
KDT4
R1803 561 (1/4W)
R1804 471 (1/4W)
R1805 471 (1/4W)
R1806 681 (1/4W)
R1807 681 (1/4W)
R1808 681 (1/4W)
NESW505C-5273
SML-310VT
D1803
D1805
D1808
D1806
D1809
D1811
D1813
D1815
D1807
D1810
D1812
D1814
D1816
SEG21
SEG20
SEG19
SEG18
SEG17
SEG16
SEG15
SEG14
SEG13
SEG12
SEG11
SEG10
SEG9
SEG8
SEG7
SEG6
SEG5
SEG4
SEG3
SEG2
SEG1
SEG0
COM3
COM2
COM1
COM0

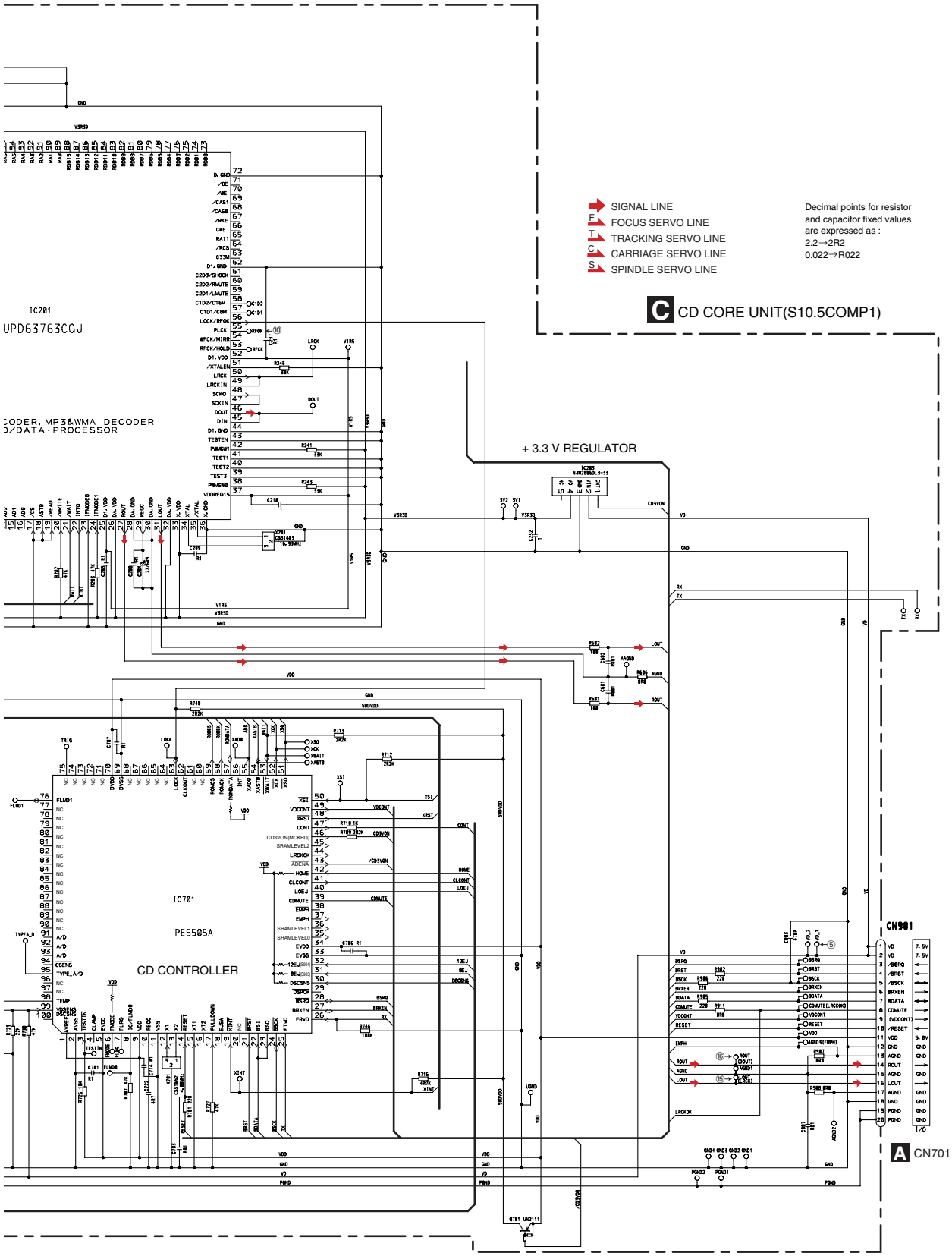
3.4 CD MECHANISM MODULE(GUIDE PAGE)

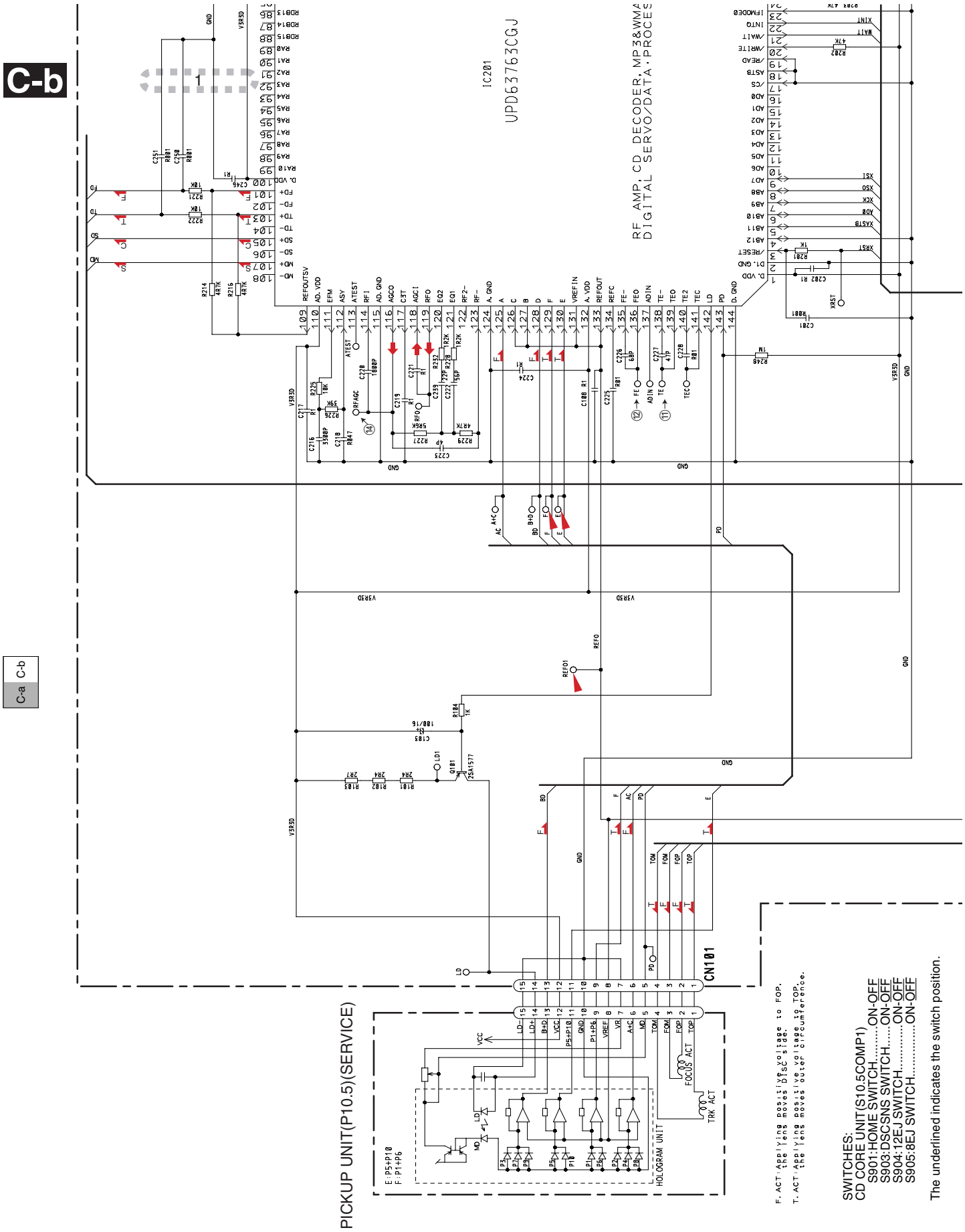
C-a



C

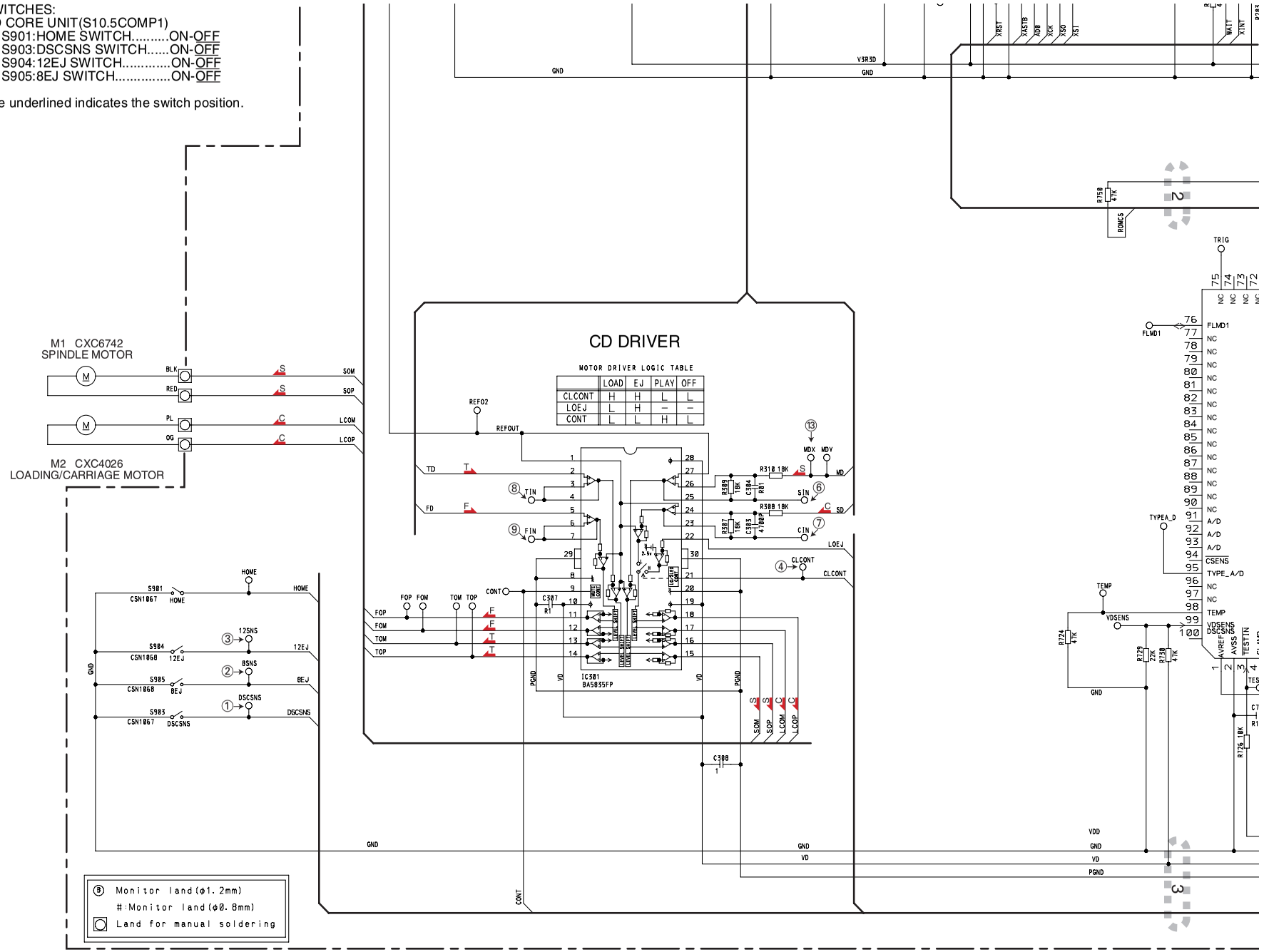
C-b


SIGNAL LINE
F FOCUS SERVO LINE
T TRACKING SERVO LINE
C CARRIAGE SERVO LINE
S SPINDLE SERVO LINE
Decimal points for resistor and capacitor fixed values are expressed as :
2.2→2R2
0.022→R022
C CD CORE UNIT(S10.5COMP1)
IC201
UPD63763CGJ
+ 3.3 V REGULATOR
IC701
PE5505A
CD CONTROLLER
CN901
A CN701


C-b
C-a
IC201
UPD63763CGJ
RF AMP, CD DECODER, MP3&WMA
DIGITAL SERVO/DATA PROCES
CN101
PICKUP UNIT(P10.5)(SERVICE)
E:P5+P10
F:P1+P6
HOLOGRAM UNIT
F. ACT Applying positive voltage to FOP.
the lens moves DISC side.
T. ACT Applying positive voltage to TOP.
the lens moves outer circumference.
SWITCHES:
CD CORE UNIT(S10.5COMP1)
S901:HOME SWITCH.....ON-OFF
S903:DSC/SNS SWITCH.....ON-OFF
S904:12EJ SWITCH.....ON-OFF
S905:8EJ SWITCH.....ON-OFF
The underlined indicates the switch position.

SWITCHES:
CD CORE UNIT(S10.5COMP1)
S901:HOME SWITCH.....ON-OFF
S903:DSCSNS SWITCH.....ON-OFF
S904:12EJ SWITCH.....ON-OFF
S905:8EJ SWITCH.....ON-OFF

The underlined indicates the switch position.



NOTE1) GND ...CD LSI, RFAMP, CPU
PGND ...Actuator, Motor Driver
AGND ...Audio
These GND's are not connected to each other on PCB.
PGND is connected to a floating mechanism part by a screw.

C-a C-b

C-a

C-b

SIGNAL LINE
FOCUS SERVO LINE
TRACKING SERVO LINE
CARRIAGE SERVO LINE
SPINDLE SERVO LINE

Decimal points for resistor and capacitor fixed values are expressed as :
2.2→2R2
0.022→R022

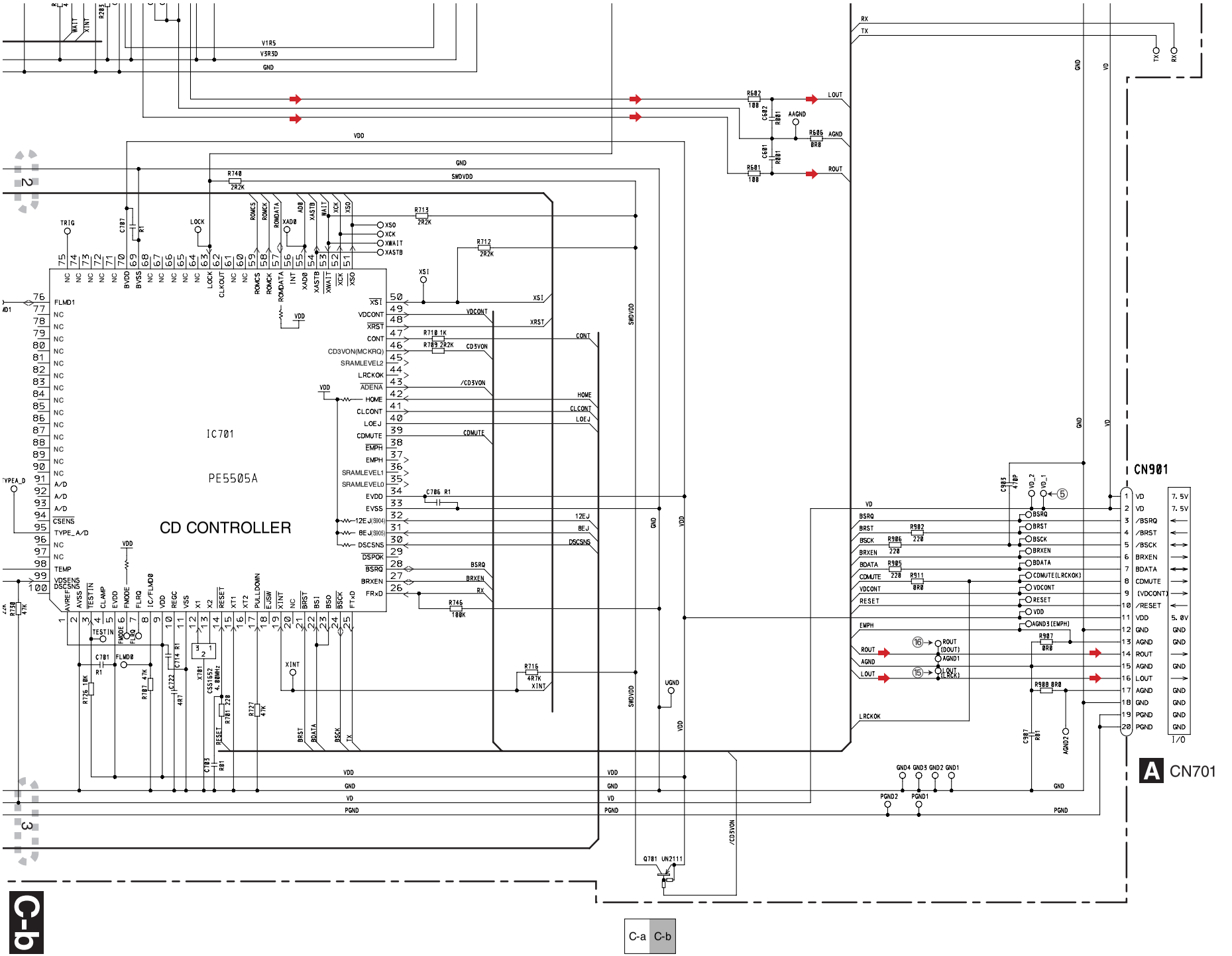
C CD CORE UNIT(S10.5COMP1)

IC201
D63763CGJ

DER, MP3&WMA DECODER
DATA・PROCESSOR

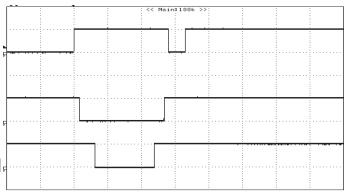
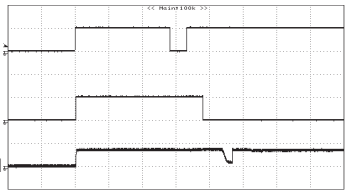
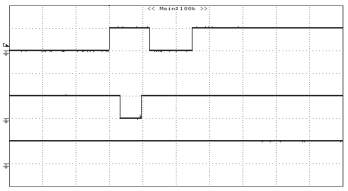
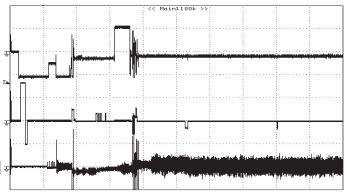
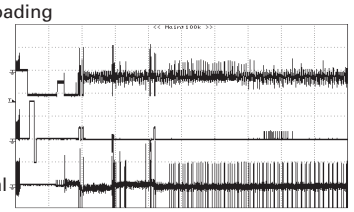
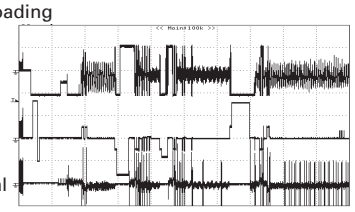
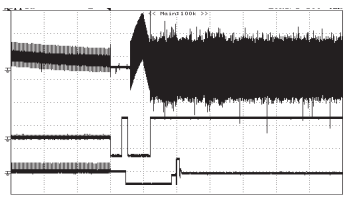
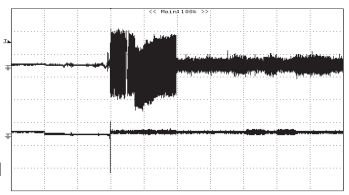
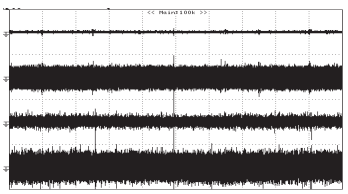
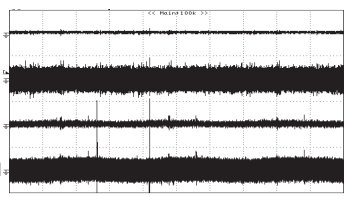
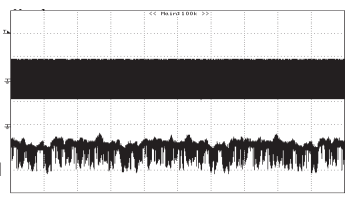
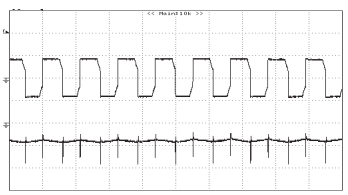
+ 3.3 V REGULATOR

IC203
NJM2886DL3-33


DEH-P4800MP/XU/EW
IC701
PE5505A
CD CONTROLLER
CN901
CN701
C-b
C-a C-b

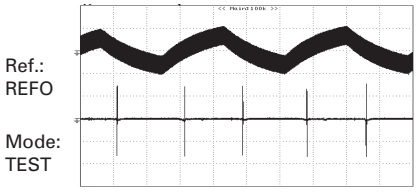
● Waveforms

Note : 1. The encircled numbers denote measuring points in the circuit diagram.
2. Reference voltage REFO1(1.65 V)

① DSCSNS 5 V/div 500 ms/div ② 8SNS 5 V/div ③ 12SNS 5 V/div 12 cm CD Loading operation Ref.: GND Mode: Normal 	① DSCSNS 5 V/div 500 ms/div ④ CLCONT 5 V/div ⑤ VD 10 V/div 12 cm CD Loading operation Ref.: GND Mode: Normal 	① DSCSNS 5 V/div 500 ms/div ② 8SNS 5 V/div ③ 12SNS 5 V/div 8 cm CD Loading operation Ref.: GND Mode: Normal 
⑥ SIN 1 V/div 1 s/div ⑦ CIN 500 mV/div ⑧ TIN 500 mV/div 12 cm CD-DA setup operation after loading Ref.: REFO Mode: Normal 	⑥ SIN 1 V/div 1 s/div ⑦ CIN 500 mV/div ⑧ TIN 500 mV/div 12 cm CD-ROM(1 session) setup operation after loading Ref.: REFO Mode: Normal 	⑥ SIN 1 V/div 1 s/div ⑦ CIN 500 mV/div ⑧ TIN 500 mV/div 12 cm CD-ROM(3 sessions) setup operation after loading Ref.: REFO Mode: Normal 
⑨ FIN 200 mV/div 500 ms/div ⑩ RFOK 2 V/div ⑥ SIN 2 V/div 12 cm CD-DA Source On setup operation Ref.: REFO Mode: Normal 	⑪ TE 500 mV/div 200 ms/div ⑫ FE 500 mV/div Source On setup operation Ref.: REFO Mode: Normal 	⑫ FE 500 mV/div 20 ms/div ⑨ FIN 500 mV/div ⑪ TE 500 mV/div ⑧ TIN 500 mV/div CD-DA Play operation Ref.: REFO Mode: Normal 
⑫ FE 500 mV/div 20 ms/div ⑨ FIN 500 mV/div ⑪ TE 500 mV/div ⑧ TIN 500 mV/div CD-ROM play operation(Regular track Jump) Ref.: REFO Mode: Normal 	⑬ MDX 2 V/div 50 ms/div ⑥ SIN 200 mV/div Spindle waveform during play operation Ref.: REFO Mode: Normal 	⑬ MDX 2 V/div 5 µs/div ⑥ SIN 500 mV/div Spindle waveform during play operation (Wider) Ref.: REFO Mode: Normal 

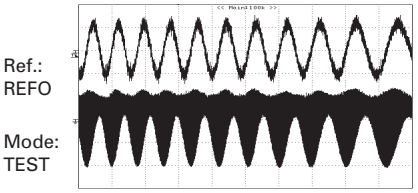
⑨ FIN	500 mV/div	200 ms/div
⑫ FE	500 mV/div	

Focus Search waveform



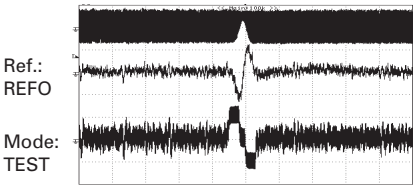
⑪ TE	500 mV/div	2 ms/div
⑭ RFAGC	500 mV/div	

Track Open waveform



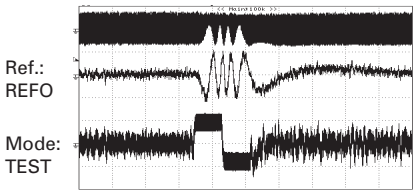
⑭ RFAGC	1 V/div	500 µs/div
⑪ TE	500 mV/div	
⑧ TIN	500 mV/div	

1 Track Jump waveform



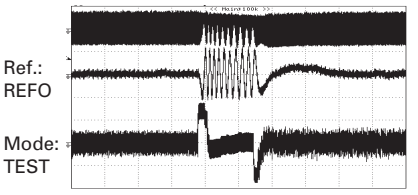
⑭ RFAGC	1 V/div	500 µs/div
⑪ TE	500 mV/div	
⑧ TIN	500 mV/div	

4 Tracks Jump waveform



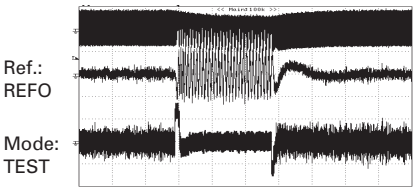
⑭ RFAGC	1 V/div	1 ms/div
⑪ TE	500 mV/div	
⑧ TIN	500 mV/div	

10 Tracks Jump waveform



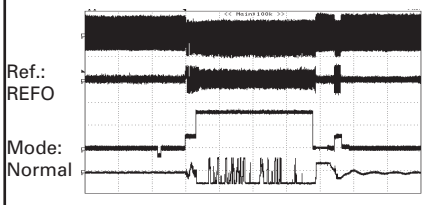
⑭ RFAGC	1 V/div	2 ms/div
⑪ TE	500 mV/div	
⑧ TIN	500 mV/div	

32 Tracks Jump waveform



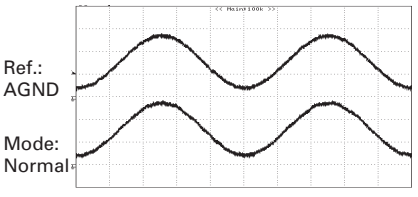
⑭ RFAGC	1 V/div	200 ms/div
⑪ TE	1 V/div	
⑦ CIN	500 mV/div	
⑥ SIN	2 V/div	

Search operation(Outter to Inner)



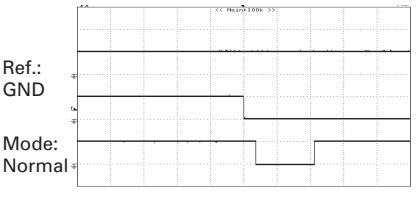
⑮ LOUT	1 V/div	200 µs/div
⑯ ROUT	1 V/div	

Analog audio waveform



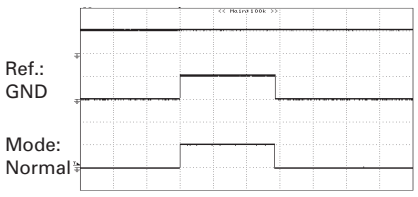
① DSCSNS	5 V/div	500 ms/div
② 8SNS	5 V/div	
③ 12SNS	5 V/div	

12 cm CD Eject operation



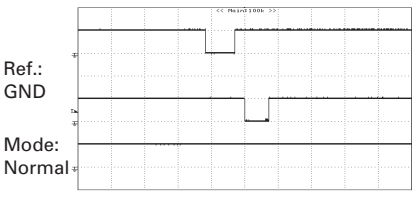
① DSCSNS	5 V/div	500 ms/div
⑤ CLCONT	5 V/div	
④ LOEJ	5 V/div	

12 cm CD Eject operation



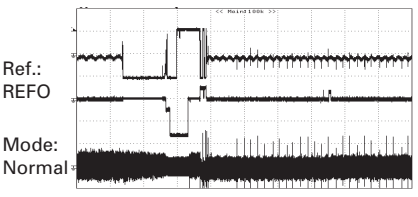
① DSCSNS	5 V/div	500 ms/div
② 8SNS	5 V/div	
③ 12SNS	5 V/div	

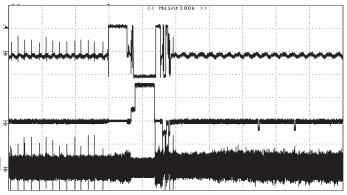
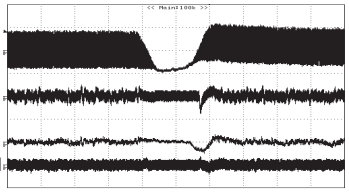
8 cm CD Eject operation



⑥ SIN	1 V/div	500 ms/div
⑦ CIN	500 mV/div	
⑧ TIN	500 mV/div	

CD-DA → CD-ROM mode change(Band key)



⑥ SIN 1 V/div 500 ms/div ⑦ CIN 500 mV/div ⑧ TIN 500 mV/div CD-ROM → CD-DA mode change(Band key) Ref.: REFO Mode: Normal 	⑭ RFAGC 1 V/div 500 µs/div ⑧ TIN 1 V/div ⑪ TE 1 V/div ⑨ FIN 1 V/div Black dot(800 µm) during play Ref.: REFO Mode: Normal 	

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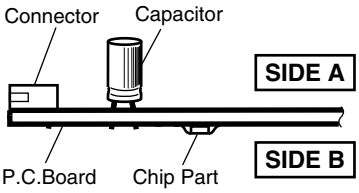
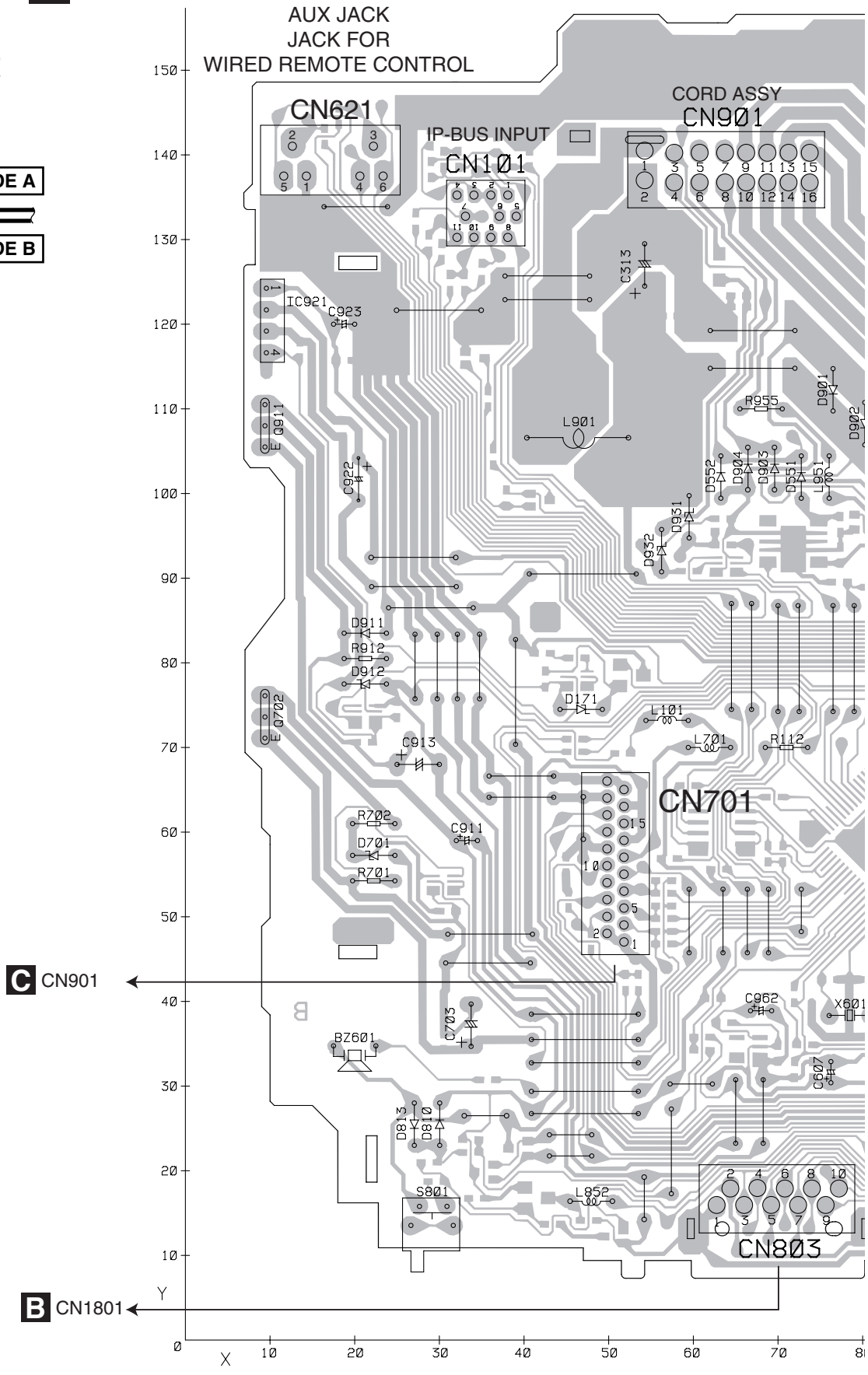
4. PCB CONNECTION DIAGRAM
4.1 TUNER AMP UNIT

NOTE FOR PCB DIAGRAMS

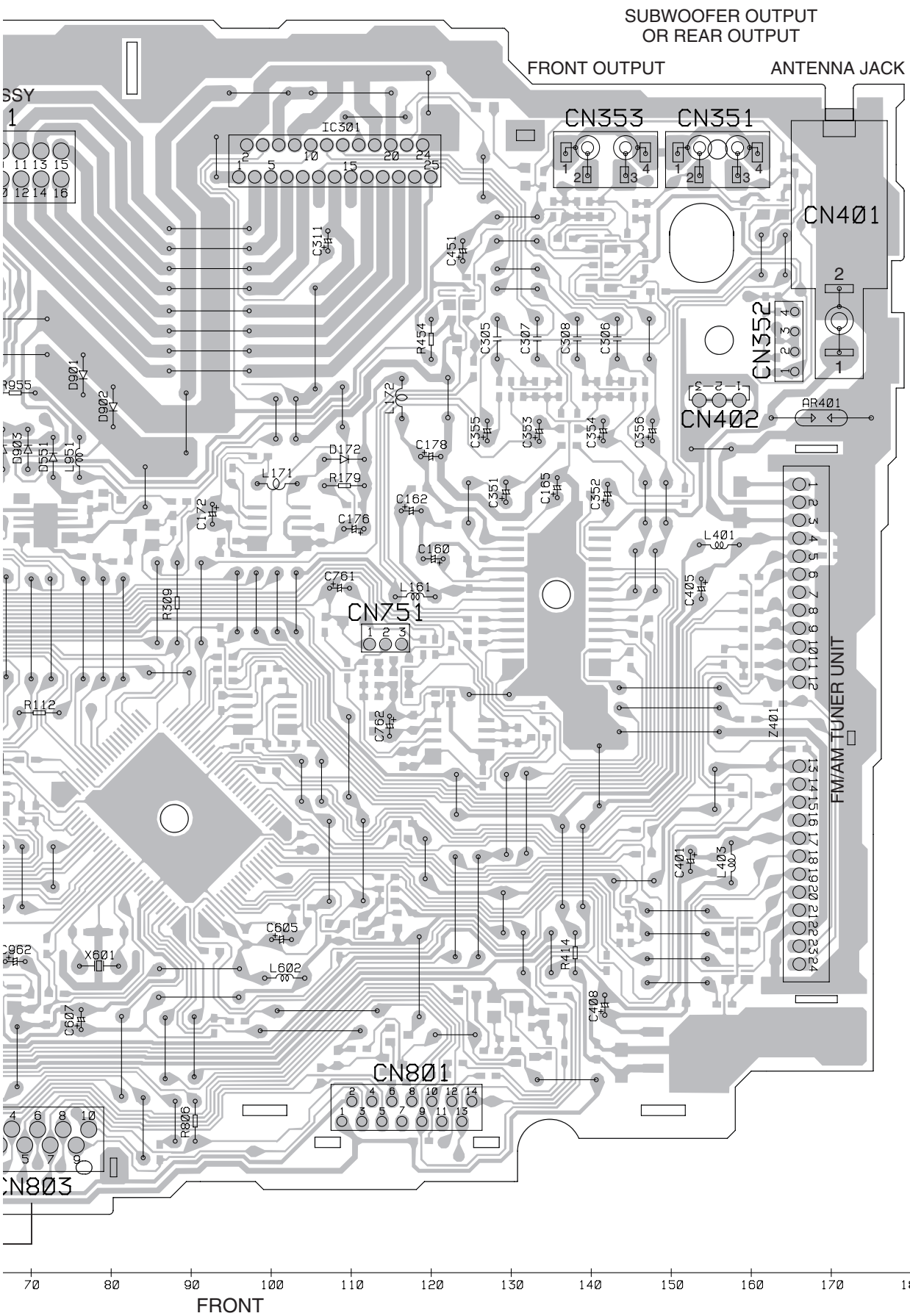
1. The parts mounted on this PCB include all necessary parts for several destination. For further information for respective destinations, be sure to check with the schematic diagram.
2. Viewpoint of PCB diagrams



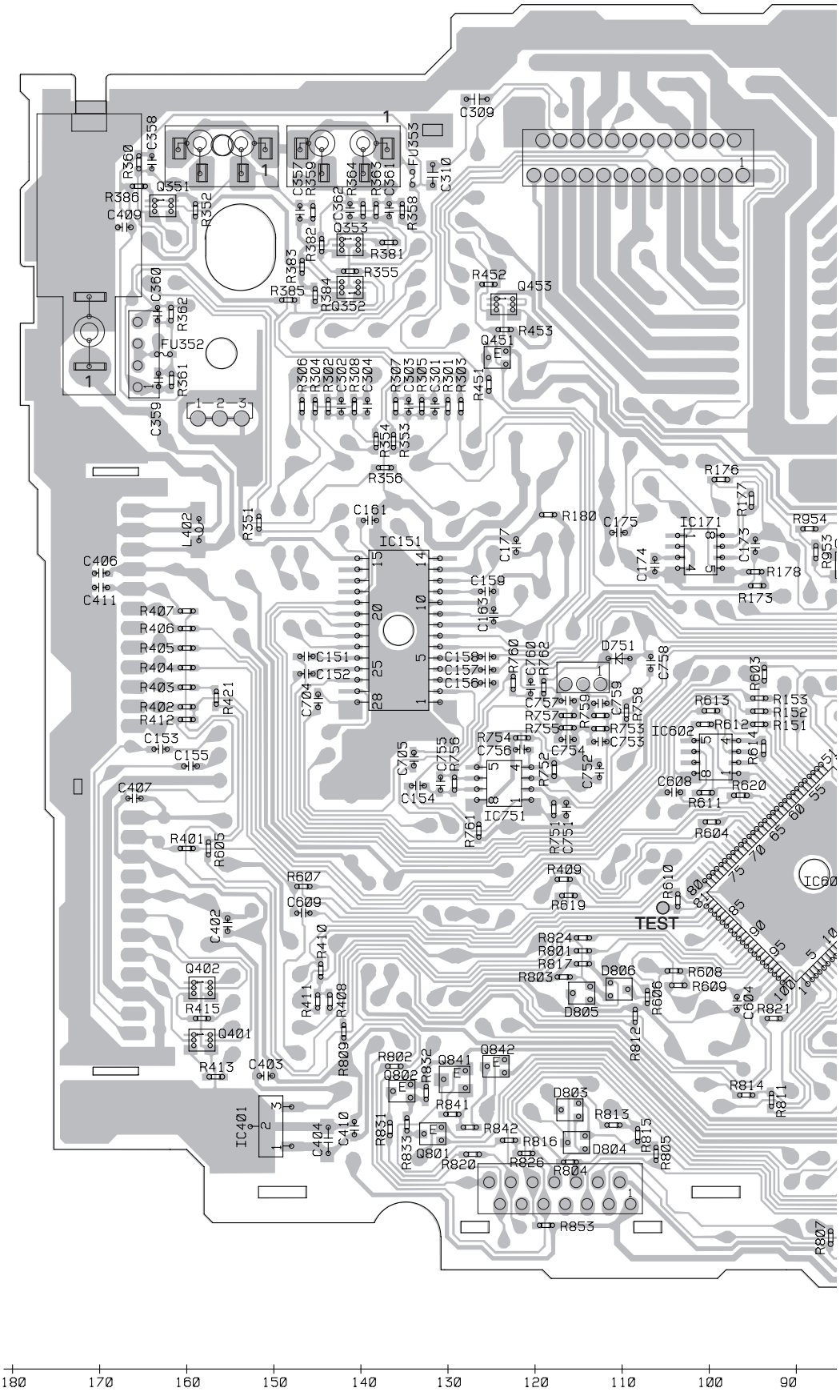
A TUNER AMP UNIT



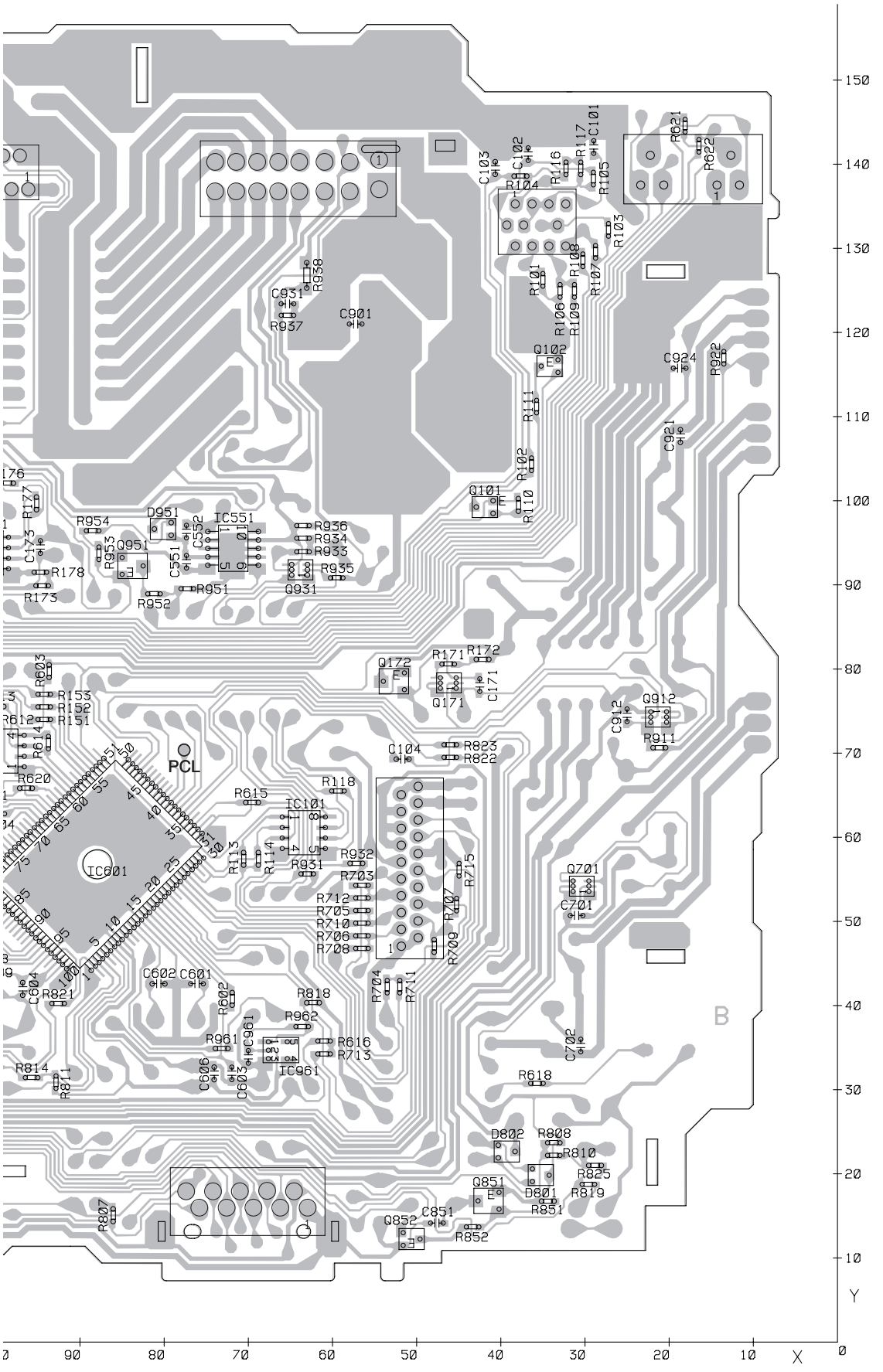
SIDE A


SUBWOOFER OUTPUT
OR REAR OUTPUT
FRONT OUTPUT
ANTENNA JACK
CN353
CN351
CN401
CN352
CN402
CN751
CN801
CN803
IC301
FM/AM TUNER UNIT
FRONT

A TUNER AMP UNIT



SIDE B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D802
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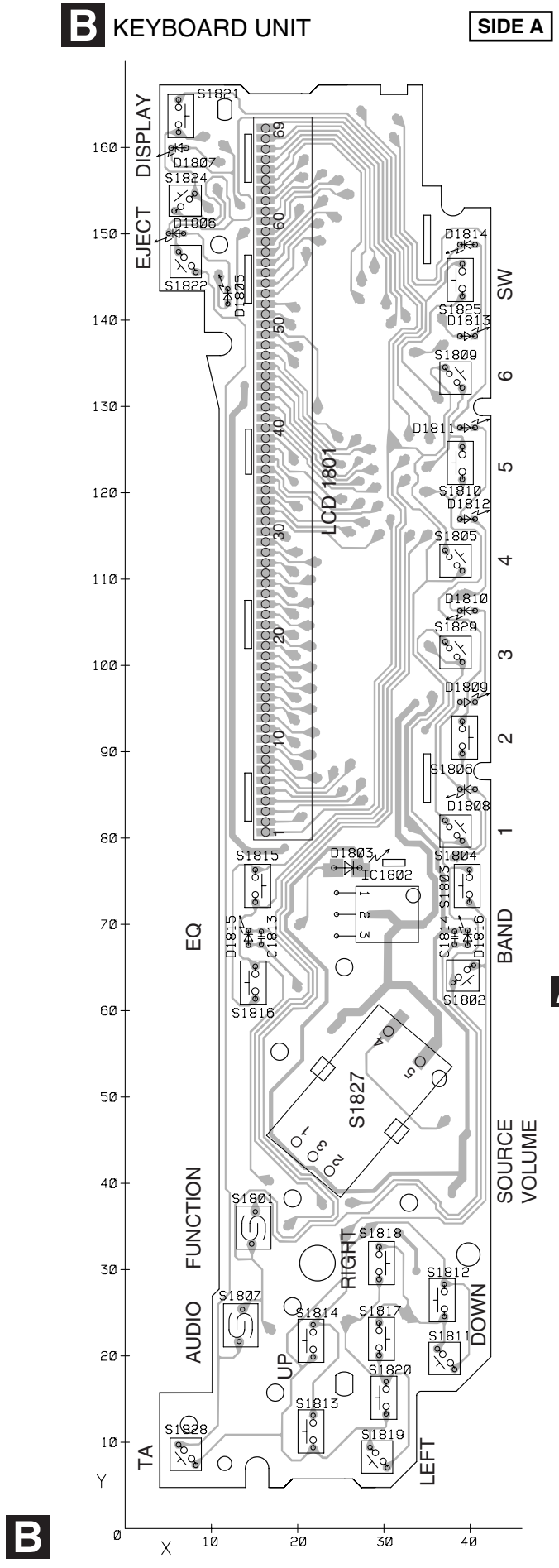
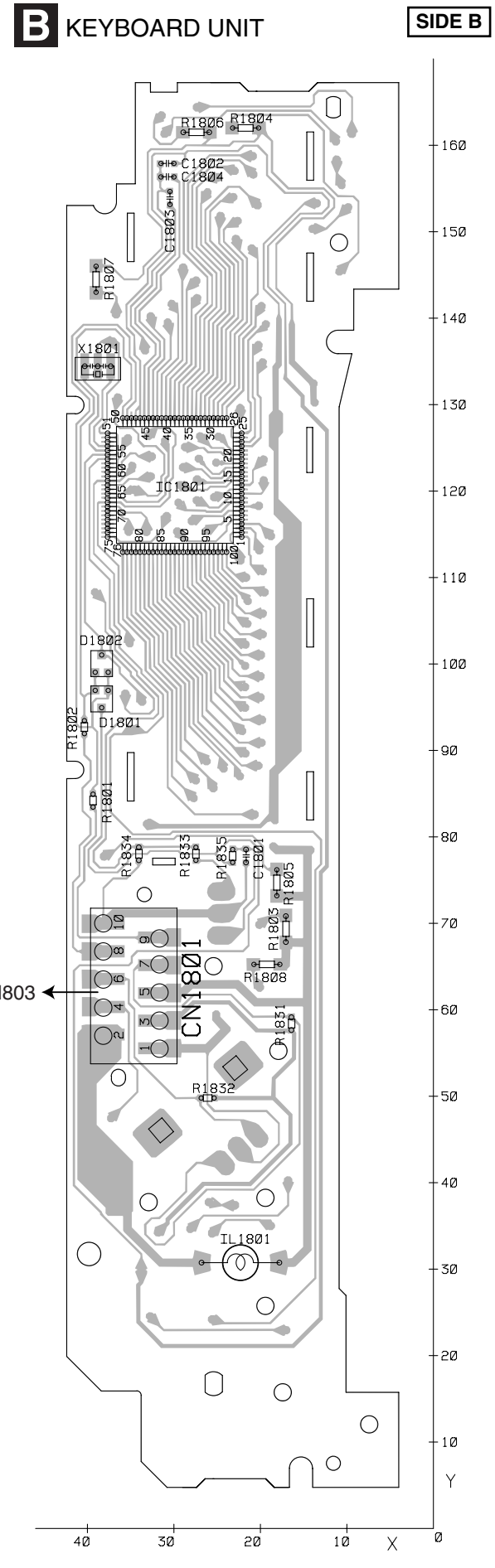
4.2 KEYBOARD UNIT





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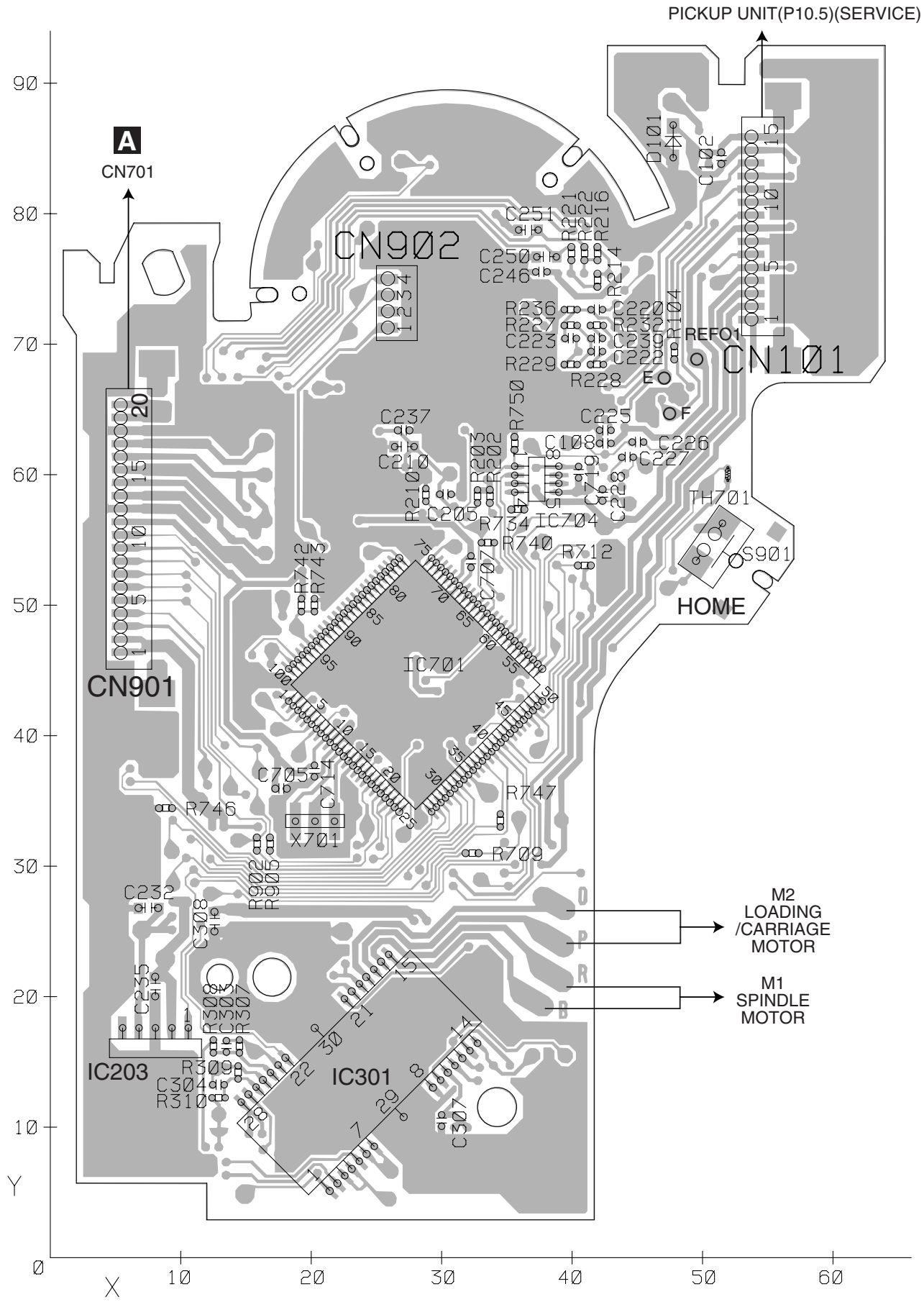
4.3 CD CORE UNIT(S10.5COMP1)

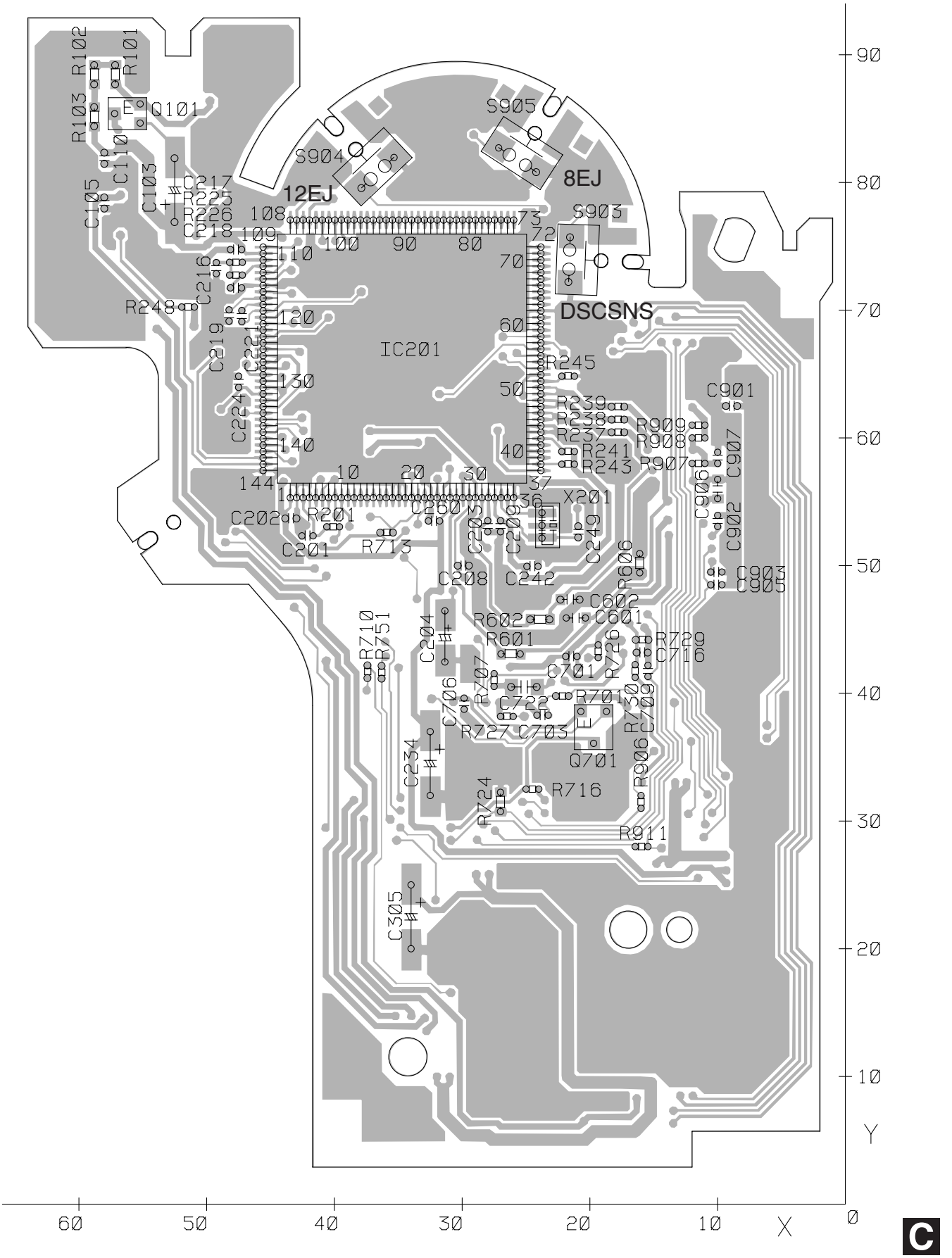
C CD CORE UNIT(S10.5COMP1)

SIDE A



C CD CORE UNIT(S10.5COMP1)

SIDE B



5. ELECTRICAL PARTS LIST

NOTE:

- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The part numbers shown below indicate chip components.*

  Chip Resistor

  RS1/◯S◯◯◯J,RS1/◯◯S◯◯◯J

  Chip Capacitor (except for CQS.....)

  CKS....., CCS....., CSZS.....
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Meaning of the figures and others in the parentheses in the parts list.*

  Example) IC 301 is on the point (face A, 91 of x-axis, and 111 of y-axis) of the corresponding PC board.

  IC 301 (A, 91, 111) IC NJM2068V

Unit Number : YWM5101
Unit Name : Tuner Amp Unit
Unit Number :
Unit Name : Keyboard Unit
Unit Number : CWX3176
Unit Name : CD Core
Unit(S10.5COMP1)

A

Unit Number : YWM5101
Unit Name : Tuner Amp Unit

MISCELLANEOUS

Circuit Symbol and No.		Part No.
IC 101	(B,63,61) IC	HA12241FP
IC 151	(B,136,85) IC	PML015A
IC 301	(A,96,137) IC	PAL007B
IC 401	(B,153,28) IC	NJM2885DL1-33
IC 601	(B,88,57) IC	PEG156B
IC 751	(B,124,67) IC	NJM4558MD
IC 921	(A,10,124) IC	NJM2388F84
IC 961	(B,67,35) IC	BD4843G
Q 101	(B,42,99) Transistor	2SA1576
Q 102	(B,34,116) Transistor	DTC114EU
Q 351	(B,163,134) Transistor	UMH3N
Q 353	(B,141,129) Transistor	UMH3N
Q 401	(B,158,38) Transistor	UMH1N
Q 402	(B,158,44) Transistor	UMH1N
Q 451	(B,124,116) Transistor	DTC124EU
Q 453	(B,124,122) Transistor	UMD2N
Q 701	(B,30,54) Transistor	UMD2N
Q 702	(A,9,71) Transistor	2SD2396
Q 841	(B,129,33) Transistor	2SA1036K
Q 842	(B,125,35) Transistor	DTC114EU
Q 851	(B,41,17) Transistor	2SA1036K
Q 852	(B,51,12) Transistor	DTC114EU
Q 911	(A,9,106) Transistor	2SD2396
Q 912	(B,21,74) Transistor	UMD2N
Q 931	(B,64,92) Transistor	UMX1N
Q 951	(B,84,92) Transistor	2SA1037K
D 701	(A,25,57) Diode	HZS7L(C3)
D 801	(B,35,20) Diode	DAN202U
D 802	(B,39,23) Diode	DAP202U
D 803	(B,116,30) Diode	DAN202U
D 804	(B,115,26) Diode	DAP202U
D 805	(B,115,43) Diode	DAN202U
D 806	(B,110,44) Diode	DAP202U
D 810	(A,30,23) Diode	1SS133
D 813	(A,27,28) Diode	1SS133
D 901	(A,77,115) Diode	S5688G
D 902	(A,80,111) Diode	S5688G
D 903	(A,70,100) Diode	S5688G
D 904	(A,66,100) Diode	S5688G
D 911	(A,24,84) Diode	S5688G
D 912	(A,24,78) Diode	HZS6L(B2)
D 931	(A,60,95) Diode	HZS7L(C3)
D 932	(A,56,91) Diode	HZS7L(A1)
D 951	(B,80,97) Diode	DAN202U
L 101	(A,54,73) Inductor	LAU2R2K
L 161	(A,116,85) Inductor	LAU2R2K
L 401	(A,159,91) Inductor	LAU1R0K
L 402	(B,159,96) Inductor	LCTAW220J2520
L 403	(A,158,54) Inductor	LAU1R0K
L 602	(A,99,37) Inductor	LAU2R2K
L 701	(A,64,70) Ferri-Inductor	LAU100K
L 852	(A,50,16) Inductor	LAU2R2K
L 901	(A,39,107) Choke Coil 600μH	CTH1280
L 951	(A,76,99) Inductor	LAU2R2K
X 601	(A,76,38) Crystal Resonator 15.000MHz	CSS1653
⚠FU353	(B,134,137) Fuse 3A	CEK1286
⚠	Fuse 10A	CEK1208
Z 401	(A,166,99) FM/AM Tuner Unit	CWE1951
AR401	(A,175,107) Surge Protector	DSP-201M-S00B

RESISTORS

R 101	(B,35,126)	RS1/16S181J
R 102	(B,36,104)	RS1/16S222J

Circuit Symbol and No.		Part No.
R 103	(B,27,132)	RS1/16S181J
R 104	(B,38,139)	RS1/16S101J
R 105	(B,29,138)	RS1/16S101J
R 106	(B,33,125)	RS1/16S223J
R 107	(B,29,130)	RS1/16S223J
R 108	(B,30,129)	RS1/16S102J
R 109	(B,31,125)	RS1/16S102J
R 110	(B,38,100)	RS1/16S332J
R 111	(B,36,111)	RS1/16S562J
R 112	(A,69,70)	RD1/4PU102J
R 113	(B,71,57)	RS1/16S472J
R 114	(B,69,57)	RS1/16S472J
R 116	(B,32,140)	RS1/16S470J
R 117	(B,31,140)	RS1/16S150J
R 118	(B,59,66)	RS1/16S0R0J
R 151	(B,94,74)	RS1/16S102J
R 152	(B,94,76)	RS1/16S102J
R 153	(B,94,77)	RS1/16S102J
R 180	(B,119,98)	RS1/16S0R0J
R 301	(B,130,111)	RS1/16S471J
R 303	(B,129,111)	RS1/16S471J
R 304	(B,145,111)	RS1/16S471J
R 306	(B,147,111)	RS1/16S471J
R 309	(A,88,79)	RD1/4PU153J
R 351	(B,152,97)	RS1/16S821J
R 352	(B,159,133)	RS1/16S0R0J
R 355	(B,141,126)	RS1/16S821J
R 356	(B,137,103)	RS1/16S821J
R 358	(B,135,133)	RS1/16S821J
R 359	(B,146,133)	RS1/16S223J
R 360	(B,166,139)	RS1/16S223J
R 363	(B,138,133)	RS1/16S223J
R 364	(B,140,133)	RS1/16S223J
R 381	(B,137,129)	RS1/16S0R0J
R 382	(B,145,129)	RS1/16S0R0J
R 386	(B,166,136)	RS1/16S0R0J
R 401	(B,160,60)	RS1/16S681J
R 402	(B,160,76)	RS1/16S681J
R 403	(B,160,78)	RS1/16S681J
R 404	(B,160,81)	RS1/16S681J
R 405	(B,160,83)	RS1/16S681J
R 406	(B,160,85)	RS1/16S681J
R 407	(B,160,87)	RS1/16S102J
R 408	(B,144,42)	RS1/16S223J
R 409	(B,117,56)	RS1/16S223J
R 410	(B,145,46)	RS1/16S223J
R 411	(B,145,42)	RS1/16S223J
R 413	(B,157,34)	RS1/16S221J
R 414	(A,138,38)	RD1/4PU1R8J
R 415	(B,158,40)	RS1/16S221J
R 421	(B,157,77)	RS1/16S0R0J
R 451	(B,125,113)	RS1/16S103J
R 452	(B,125,125)	RS1/16S221J
R 453	(B,124,119)	RS1/16S153J
R 454	(A,120,119)	RD1/4PU102J
R 602	(B,72,41)	RS1/16S103J
R 603	(B,94,80)	RS1/16S103J
R 604	(B,100,63)	RS1/16S681J
R 605	(B,158,60)	RS1/16S681J
R 606	(B,107,43)	RS1/16S103J

Circuit Symbol and No.		Part No.
R 607	(B,147,55)	RS1/16S681J
R 610	(B,104,54)	RS1/16S473J
R 612	(B,101,74)	RS1/16S103J
R 613	(B,100,76)	RS1/16S103J
R 615	(B,70,64)	RS1/16S0R0J
R 616	(B,61,36)	RS1/16S473J
R 619	(B,116,54)	RS1/16S0R0J
R 620	(B,96,66)	RS1/16S0R0J
R 621	(B,18,145)	RS1/16S102J
R 622	(B,16,142)	RS1/16S102J
R 701	(A,20,54)	RD1/4PU271J
R 702	(A,20,61)	RD1/4PU121J
R 703	(B,57,54)	RS1/16S682J
R 704	(B,54,42)	RS1/16S682J
R 705	(B,57,51)	RS1/16S682J
R 706	(B,57,48)	RS1/16S682J
R 707	(B,45,52)	RS1/16S104J
R 708	(B,57,47)	RS1/16S221J
R 709	(B,48,47)	RS1/16S221J
R 710	(B,57,50)	RS1/16S221J
R 711	(B,52,42)	RS1/16S221J
R 712	(B,57,53)	RS1/16S221J
R 713	(B,61,34)	RS1/16S102J
R 715	(B,45,56)	RS1/16S0R0J
R 751	(B,118,64)	RS1/16S103J
R 752	(B,118,69)	RS1/16S103J
R 753	(B,113,74)	RS1/16S103J
R 754	(B,122,72)	RS1/16S103J
R 755	(B,116,74)	RS1/16S103J
R 756	(B,129,67)	RS1/16S103J
R 757	(B,116,75)	RS1/16S103J
R 758	(B,110,75)	RS1/16S103J
R 759	(B,113,75)	RS1/16S103J
R 760	(B,123,79)	RS1/16S103J
R 761	(B,126,62)	RS1/16S0R0J
R 762	(B,119,78)	RS1/16S0R0J
R 803	(B,117,45)	RS1/16S473J
R 804	(B,116,24)	RS1/16S222J
R 805	(B,106,25)	RS1/16S222J
R 806	(A,91,16)	RD1/4PU222J
R 807	(B,86,15)	RS1/16S222J
R 808	(B,34,24)	RS1/16S104J
R 809	(B,142,39)	RS1/16S222J
R 810	(B,34,22)	RS1/16S103J
R 811	(B,93,31)	RS1/16S473J
R 813	(B,111,28)	RS1/16S104J
R 814	(B,96,31)	RS1/16S102J
R 815	(B,108,27)	RS1/16S102J
R 816	(B,123,26)	RS1/16S1R0J
R 822	(B,46,70)	RS1/16S102J
R 823	(B,46,71)	RS1/16S102J
R 824	(B,115,50)	RS1/16S102J
R 825	(B,29,21)	RS1/16S102J
R 826	(B,121,25)	RS1/16S0R0J
R 841	(B,130,29)	RS1/16S103J
R 842	(B,128,28)	RS1/16S222J
R 851	(B,34,17)	RS1/16S153J
R 852	(B,43,14)	RS1/16S153J
R 853	(B,119,17)	RS1/16S222J
R 911	(B,21,71)	RS1/16S223J

Circuit Symbol and No.		Part No.
R 912	(A,24,81)	RD1/4PU152J
R 922	(B,14,117)	RS1/16S473J
R 931	(B,63,56)	RS1/16S104J
R 932	(B,57,57)	RS1/16S104J
R 933	(B,64,94)	RS1/16S104J
R 934	(B,64,96)	RS1/16S473J
R 935	(B,60,91)	RS1/16S473J
R 936	(B,64,97)	RS1/16S473J
R 937	(B,65,122)	RS1/16S473J
R 938	(B,63,127)	RS1/4SA102J
R 951	(B,77,90)	RS1/16S473J
R 952	(B,81,89)	RS1/16S102J
R 953	(B,88,94)	RS1/16S472J
R 954	(B,89,96)	RS1/16S472J
R 955	(A,71,110)	RD1/4PU153J
R 961	(B,73,35)	RS1/16S102J
R 962	(B,64,38)	RS1/16S822J

CAPACITORS

C 101	(B,29,142)	CKSRYB104K16
C 104	(B,52,69)	CKSRYB103K50
C 151	(B,146,82)	CKSRYB105K10
C 152	(B,146,80)	CKSRYB105K10
C 153	(B,163,71)	CKSRYB224K16
C 154	(B,133,67)	CKSRYB474K10
C 155	(B,160,69)	CKSRYB224K16
C 156	(B,126,79)	CKSRYB474K10
C 157	(B,126,80)	CKSRYB105K10
C 158	(B,126,82)	CKSRYB105K10
C 159	(B,126,89)	CKSRYB153K50
C 160	(A,122,89)	CEJQ100M16
C 161	(B,139,97)	CKSRYB153K50
C 162	(A,116,95)	CEJQ470M10
C 163	(B,125,87)	CKSRYB104K25
C 165	(A,136,97)	CEJQ100M16
C 305	(A,128,119)	CFTNA224J50
C 306	(A,143,119)	CFTNA224J50
C 307	(A,133,119)	CFTNA224J50
C 308	(A,138,119)	CFTNA224J50
C 309	(B,127,146)	CKSQYB225K10
C 310	(B,132,137)	CKSQYB225K10
C 311	(A,107,128)	CEJQ100M16
C 313	(A,54,125) 3300μF/16V	CCH1494
C 351	(A,129,96)	CEJQ2R2M50
C 352	(A,142,96)	CEJQ2R2M50
C 355	(A,127,104)	CEJQ2R2M50
C 356	(A,148,104)	CEJQ2R2M50
C 357	(B,147,133)	CKSRYB222K50
C 358	(B,164,139)	CKSRYB222K50
C 401	(A,152,53)	CEJQ470M6R3
C 402	(B,155,51)	CKSRYB103K50
C 403	(B,151,34)	CKSRYB103K50
C 404	(B,144,26)	CKSYB475K10
C 405	(A,154,87)	CEJQ101M10
C 406	(B,170,91)	CKSRYB104K25
C 407	(B,166,66)	CKSRYB103K50
C 408	(A,142,32)	CEJQ220M16
C 451	(A,124,127)	CEJQ330M10
C 601	(B,76,43)	CCSRCH180J50
C 602	(B,81,43)	CCSRCH200J50
C 604	(B,97,42)	CKSRYB104K16
C 605	(A,100,42)	CEJQ100M16
C 606	(B,74,32)	CKSRYB104K16
C 607	(A,76,30)	CEJQ100M16
C 609	(B,147,52)	CCSRCH470J50
C 701	(B,31,51)	CKSRYB473K25
C 703	(A,34,35) 470μF/16V	CCH1331
C 704	(B,145,77)	CKSRYB105K10
C 705	(B,134,70)	CKSRYB105K10
C 751	(B,116,64)	CCSRCH101J50
C 752	(B,113,69)	CKSRYB105K10
C 753	(B,113,72)	CCSRCH101J50
C 754	(B,116,72)	CCSRCH101J50
C 755	(B,131,67)	CCSRCH101J50
C 756	(B,122,71)	CKSRYB105K10
C 757	(B,116,77)	CKSRYB474K10
C 758	(B,107,81)	CKSRYB474K10
C 759	(B,113,76)	CKSRYB474K10
C 760	(B,121,78)	CKSRYB474K10
C 761	(A,107,86)	CEJQR47M50
C 762	(A,115,70)	CEJQ101M10
C 851	(B,48,14)	CKSRYB104K16
C 901	(B,57,121)	CKSRYB104K50
C 911	(A,32,59)	CEJQ470M10
C 912	(B,25,75)	CKSRYB103K50
C 913	(A,25,68) 470μF/16V	CCH1331
C 921	(B,19,108)	CKSRYB103K50
C 922	(A,20,104)	CEJQ221M10
C 923	(A,18,120)	CEJQ101M16
C 924	(B,19,116)	CKSRYB103K50
C 961	(B,70,34)	CKSRYB473K25
C 962	(A,67,39)	CEJQ100M16

B

Unit Number :
Unit Name : Keyboard Unit

MISCELLANEOUS

IC 1801	(B,30,121) IC	PD6538A
IC 1802	(A,25,71) IC	TSOP4840SB1
D 1801	(B,38,96) Diode	DAN202U
D 1802	(B,38,100) Diode	DAP202U
D 1803	(A,26,77) LED	NESW505C-5273
D 1805	(A,12,143) LED	SML-310VT
D 1806	(A,6,150) LED	SML-310VT
D 1807	(A,6,160) LED	SML-310VT
D 1808	(A,40,86) LED	SML-310VT
D 1809	(A,40,96) LED	SML-310VT
D 1810	(A,40,106) LED	SML-310VT
D 1811	(A,40,128) LED	SML-310VT
D 1812	(A,40,117) LED	SML-310VT
D 1813	(A,40,138) LED	SML-310VT
D 1814	(A,40,149) LED	SML-310VT
D 1815	(A,14,68) LED	SML-310VT
D 1816	(A,40,68) LED	SML-310VT
X 1801	(B,39,134) Ceramic Resonator 5.00MHz	CSS1547
S 1827	(A,27,50) Encoder(SOURCE,VOLUME)	YSD5005
IL 1801	(B,22,31) Lamp 40mA,14V	CEL1662

Circuit Symbol and No.			Part No.
LCD1801	(A,16,81)	LCD	YAW5054

RESISTORS

R 1801	(B,39,84)		RS1/16S222J
R 1802	(B,40,93)		RS1/16S222J
R 1803	(B,17,69)		RS1/4SA561J
R 1804	(B,22,162)		RS1/4SA471J
R 1805	(B,18,75)		RS1/4SA471J
R 1806	(B,27,162)		RS1/4SA681J
R 1807	(B,39,145)		RS1/4SA681J
R 1808	(B,19,65)		RS1/4SA681J
R 1831	(B,16,58)		RS1/16S472J
R 1832	(B,26,50)		RS1/16S472J
R 1833	(B,27,78)		RS1/16S2R2J
R 1835	(B,23,78)		RS1/16S121J

CAPACITORS

C 1801	(B,22,78)		CKSRYB474K10
C 1802	(B,31,158)		CKSRYF104Z25
C 1803	(B,30,154)		CKSRYF104Z25
C 1804	(B,31,156)		CKSRYF104Z25

C

Unit Number : CWX3176
Unit Name : CD Core Unit(S10.5COMP1)

MISCELLANEOUS

IC 201	(B,39,70)	IC	UPD63763CGJ
IC 203	(A,12,16)	IC	NJM2886DL3-33
IC 301	(A,28,18)	IC	BA5835FP
IC 701	(A,32,48)	IC	PE5505A
Q 101	(B,60,89)	Transistor	2SA1577
Q 701	(B,24,41)	Transistor	UN2111
X 201	(B,28,57)	Ceramic Resonator 16.934MHz	CSS1603
X 701	(A,24,37)	Ceramic Resonator 4.000MHz	CSS1652
S 901	(A,57,57)	Switch(HOME)	CSN1067
S 903	(B,23,78)	Switch(DSCSNS)	CSN1067
S 904	(B,42,87)	Switch(12EJ)	CSN1068
S 905	(B,28,88)	Switch(8EJ)	CSN1068

RESISTORS

R 101	(B,61,92)		RS1/10SR2R4J
R 102	(B,63,92)		RS1/10SR2R4J
R 103	(B,63,89)		RS1/10SR2R7J
R 104	(A,52,73)		RS1/16SS102J
R 201	(B,44,57)		RS1/16SS102J
R 202	(A,38,62)		RS1/16SS473J
R 203	(A,37,62)		RS1/16SS473J
R 214	(A,46,79)		RS1/16SS472J
R 216	(A,46,81)		RS1/16SS472J
R 221	(A,44,81)		RS1/16SS103J
R 222	(A,45,81)		RS1/16SS103J
R 225	(B,52,78)		RS1/16SS103J
R 226	(B,52,77)		RS1/16SS393J
R 227	(A,44,75)		RS1/16SS562J
R 228	(A,46,72)		RS1/16SS122J
R 229	(A,44,72)		RS1/16SS472J
R 232	(A,46,75)		RS1/16SS122J
R 241	(B,26,63)		RS1/16SS333J
R 243	(B,26,62)		RS1/16SS333J
R 245	(B,26,69)		RS1/16SS333J
R 248	(B,55,74)		RS1/16SS105J
R 307	(A,19,20)		RS1/16SS183J
R 308	(A,17,20)		RS1/16SS183J
R 309	(A,18,18)		RS1/16SS183J
R 310	(A,17,16)		RS1/16SS183J
R 601	(B,30,47)		RS1/16S101J
R 602	(B,28,50)		RS1/16S101J
R 606	(B,20,54)		RS1/16S0R0J
R 701	(B,26,44)		RS1/16SS221J
R 707	(B,32,45)		RS1/16SS473J
R 709	(A,36,35)		RS1/16SS222J
R 710	(B,41,46)		RS1/16SS102J
R 712	(A,45,57)		RS1/16SS222J
R 713	(B,40,57)		RS1/16SS222J
R 716	(B,29,37)		RS1/16SS472J
R 724	(B,31,36)		RS1/16S473J
R 726	(B,23,47)		RS1/16SS103J
R 727	(B,31,42)		RS1/16SS473J
R 729	(B,20,48)		RS1/16SS223J
R 730	(B,20,46)		RS1/16SS473J
R 740	(A,38,59)		RS1/16SS222J
R 746	(A,13,38)		RS1/16SS104J
R 750	(A,40,66)		RS1/16SS473J
R 902	(A,20,36)		RS1/16SS221J
R 905	(A,21,36)		RS1/16SS221J
R 906	(B,20,36)		RS1/16SS221J
R 907	(B,16,62)		RS1/16SS0R0J
R 908	(B,16,64)		RS1/16SS0R0J
R 911	(B,20,32)		RS1/16SS0R0J

CAPACITORS

C 103	(B,57,83)		CEVW101M16
C 108	(A,47,66)		CKSSYB104K10
C 201	(B,46,56)		CKSSYB102K50
C 202	(B,47,58)		CKSSYB104K10
C 204	(B,35,48)		CEVW220M6R3
C 205	(A,34,63)		CKSSYB104K10
C 208	(B,34,54)		CKSSYB104K10
C 209	(B,31,57)		CKSSYB104K10
C 210	(A,31,66)		CKSRYB105K10
C 216	(B,53,77)		CKSSYB332K50
C 217	(B,52,79)		CKSSYB104K10
C 218	(B,52,76)		CKSSYB473K10
C 219	(B,52,74)		CKSSYB104K10
C 220	(A,46,77)		CKSSYB182K50
C 221	(B,51,74)		CKSSYB104K10
C 222	(A,46,73)		CCSSCH560J50
C 223	(A,44,74)		CCSSCH4R0C50
C 224	(B,52,68)		CKSSYB104K10
C 225	(A,47,67)		CKSSYB103K16
C 226	(A,49,67)		CCSSCH680J50
C 227	(A,48,65)		CCSSCH470J50
C 228	(A,46,62)		CKSSYB103K16
C 232	(A,12,31)		CKSRYB105K10
C 237	(A,31,67)		CKSSYB104K10

Circuit Symbol and No.		Part No.
C 239	(A,46,74)	CCSSCH220J50
C 246	(A,42,80)	CKSSYB104K10
C 250	(A,42,81)	CKSRYB102K50
C 251	(A,41,83)	CKSRYB102K50
C 303	(A,18,20)	CKSSYB472K25
C 304	(A,17,17)	CKSSYB103K16
C 307	(A,34,15)	CKSSYB104K10
C 308	(A,17,30)	CKSRYB105K10
C 601	(B,25,50)	CCSRCH102J50
C 602	(B,26,51)	CCSRCH102J50
C 701	(B,25,47)	CKSSYB104K10
C 703	(B,28,42)	CKSSYB103K16
C 706	(B,34,43)	CKSSYB104K10
C 707	(A,36,57)	CKSSYB104K10
C 714	(A,24,41)	CKSSYB104K10
C 722	(B,29,45)	CKSQYB475K6R3
C 903	(B,14,54)	CKSSYB471K50
C 907	(B,14,62)	CKSSYB103K16

Miscellaneous Parts List

	Pickup Unit(P10.5)(Service)	CXX1942
M 1	Motor Unit(SPINDLE)	CXC6742
M 2	Motor Unit(LOADING/CARRIAGE)	CXC4026

6. ADJUSTMENT

6.1 CD ADJUSTMENT

1) Cautions on adjustments

• In this product the single voltage (3.3V) is used for the regulator. The reference voltage is the REFO1 (1.65V) instead of the GND.

If you should mistakenly short the REFO1 with the GND during adjustment, accurate voltage will not be obtained, and the servo's misoperation will apply excessive shock to the pickup. To avoid such problems:

a. Do not mix up the REFO1 with the GND when connecting the (-) probe of measuring instruments. Especially on an oscilloscope, avoid connecting the (-) probe for CH1 to the GND.

b. In many cases, measuring instruments have the same potential as that for the (-) probe. Be sure to set the measuring instruments to the floating state.

c. If you have mistakenly connected the REFO1 to the GND, turn off the regulator or the power immediately.

• Before mounting and removing filters or leads for adjustment, be sure to turn off the regulator.

• For stable circuit operation, keep the mechanism operating for about one minute or more after the regulator is turned on.

• In the test mode, any software protections will not work. Avoid applying any mechanical or electrical shock to the mechanism during adjustment.

• The RFI and RFO signals with a wide frequency range are easy to oscillate. When observing the signals, insert a resistor of 1k ohms in series.

• The load and eject operation is not guarantied with the mechanism upside down. If the mechanism is blocked due to mistaken eject operation, reset the product or turn off and on the ACC to restore it.

2) Test mode

This mode is used to adjust the CD mechanism module.

• To enter the test mode.

While pressing the 4 and 6 keys at the same time, reset.

• To exit from the test mode.

Turn off the ACC and back up.

Notes:

a. During ejection, do not press any other keys than the EJECT key until the loaded disc is ejected.

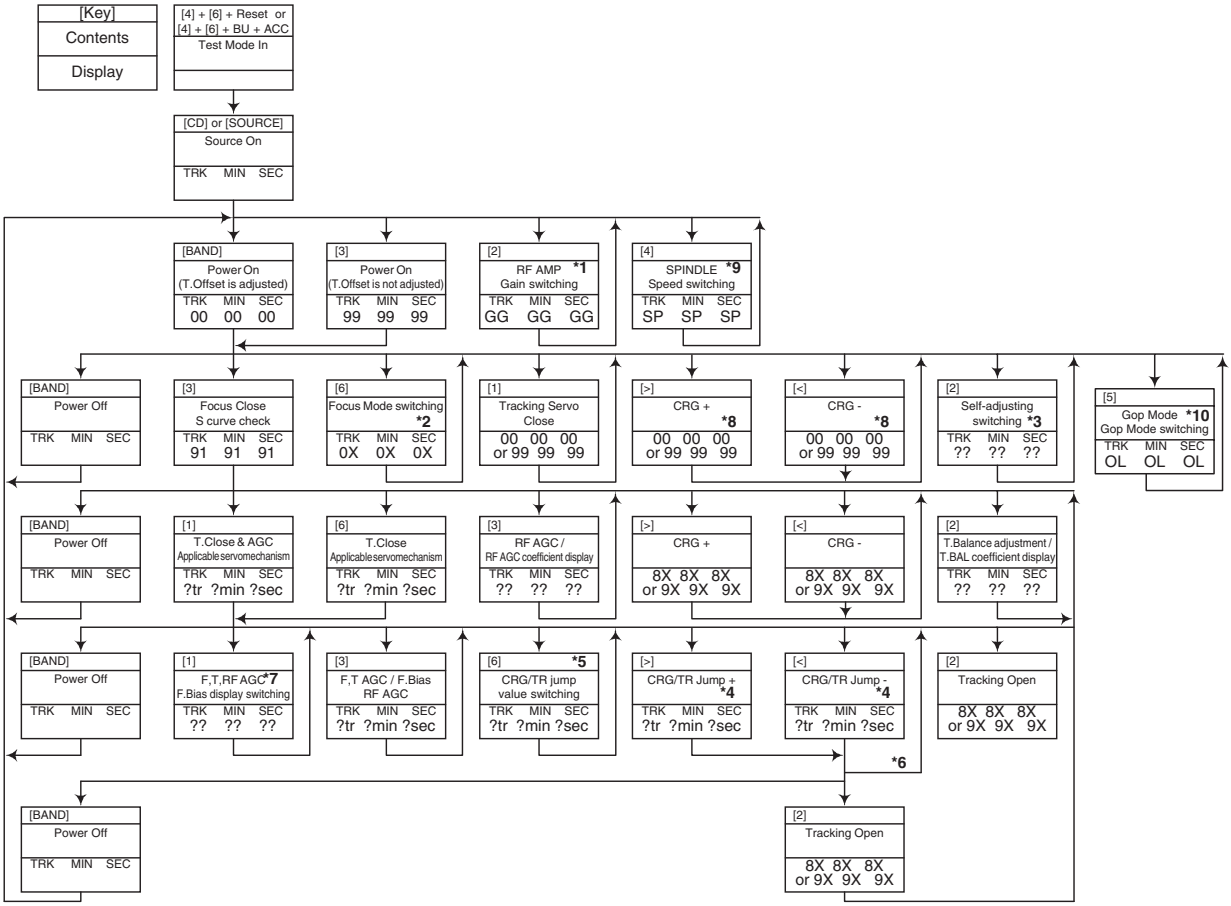
b. If you have pressed the (→) key or (←) key during focus search, turn off the power immediately to protect the actuator from damage caused by the lens stuck.

c. For the TR jump modes except 100TR, the track jump operation will continue even if the key is released.

d. For the CRG move and 100TR jump modes, the tracking loop will be closed at the same time when the key is released.

e. When the power is turned off and on, the jump mode is reset to the single TR (91), the RF amp gain is set to 0dB, and the auto-adjustment values are reset to the default settings.

● Flow Chart


[Key]
Contents
Display
[4] + [6] + Reset or [4] + [6] + BU + ACC
Test Mode In
[CD] or [SOURCE]
Source On
TRK MIN SEC
[BAND] Power On (T.Offset is adjusted) TRK MIN SEC 00 00 00
[3] Power On (T.Offset is not adjusted) TRK MIN SEC 99 99 99
[2] RF AMP *1 Gain switching TRK MIN SEC GG GG GG
[4] SPINDLE *9 Speed switching TRK MIN SEC SP SP SP
[BAND] Power Off TRK MIN SEC
[3] Focus Close S curve check TRK MIN SEC 91 91 91
[6] Focus Mode switching *2 TRK MIN SEC 0X 0X 0X
[1] Tracking Servo Close 00 00 00 or 99 99 99
[>] CRG + *8 00 00 00 or 99 99 99
[<] CRG - *8 00 00 00 or 99 99 99
[2] Self-adjusting switching *3 TRK MIN SEC ?? ?? ??
[5] Gop Mode *10 Gop Mode switching TRK MIN SEC OL OL OL
[1] T.Close & AGC Applicable servomechanism TRK MIN SEC ?tr ?min ?sec
[6] T.Close Applicable servomechanism TRK MIN SEC ?tr ?min ?sec
[3] RF AGC / RF AGC coefficient display TRK MIN SEC ?? ?? ??
8X 8X 8X or 9X 9X 9X
[2] T.Balance adjustment / T.BAL coefficient display TRK MIN SEC ?? ?? ??
[1] F,T,RF AGC *7 F.Bias display switching TRK MIN SEC ?? ?? ??
[3] F,T AGC / F.Bias RF AGC TRK MIN SEC ?tr ?min ?sec
[6] *5 CRG/TR jump value switching TRK MIN SEC ?tr ?min ?sec
[>] CRG/TR Jump + *4 TRK MIN SEC ?tr ?min ?sec
[<] CRG/TR Jump - *4 TRK MIN SEC ?tr ?min ?sec
[2] Tracking Open 8X 8X 8X or 9X 9X 9X
*6

*1) TYP (TRK MIN SEC) → + 6 dB ($^{TRK}06^{MIN}06^{SEC}06$) → + 12 dB ($^{TRK}12^{MIN}12^{SEC}12$)

*2) Focus Close → S Curve check setting → F EQ measurement setting
$^{TRK}00^{MIN}00^{SEC}00$ ($^{TRK}99^{MIN}99^{SEC}99$) $^{TRK}01^{MIN}01^{SEC}01$ $^{TRK}02^{MIN}02^{SEC}02$

*3) F.Offset Display → RF.Offset → T.Offset Display → Switch to the order of the original display

*4) 1TR/4TR/10TR/32TR/100TR

*5) Single → 4TR → 10TR → 32TR → 100TR → CRG Move
9x(8x):91(81) 92(82) 93(83) 94(84) 95(85) 96(86)

*6) Only at the time of CRG move, 100TR jump

*7) TRK/MIN/SEC → F.AGC → T.AGC Gain → F.Bias → RF AGC

*8) CRG motor voltage = 2 [V]

*9) TYP (1X) (TRK MIN SEC) → 2X ($^{TRK}22^{MIN}22^{SEC}22$) → 1X ($^{TRK}11^{MIN}11^{SEC}11$)

*10) OFF(TYP) (TRK MIN SEC) → FORCUS ($^{TRK}70^{MIN}70^{SEC}70$) → TRACKING ($^{TRK}71^{MIN}71^{SEC}71$)

[Key]	Operation Test Mode
[BAND]	Power On/Off
[>]	CRG + / TR Jump + (Direction of the external surface)
[<]	CRG - / TR Jump - (Direction of the internal surface)
[1]	T. CLS & AGC & Applicable servomechanism / AGC,AGC display setting
[2]	RF Gain switching / Offset adjustment display / T.Balance adjustment / T. Open
[3]	F. Close,S Curve / Rough Servo and RF AGC / F,T,RF AGC
[4]	SPDL 1X/2X switching As for the double speed(2x), audio output cannot be supported.
[5]	Error Rate measurement ON : ERR 30Counts Start BER display data[%]
[6]	F. Mode switching / Tracking Close / CRG•TR Jump Switching

• As for the double speed (2x), audio output cannot be supported

*) • After the [Eject] key is pressed keys other than the [Eject] key should not be pressed, until disc ejection is complete.
• When the key [2] or [3] is pressed during the Focus Search, the power supply should be immediately turned off (otherwise the lens sticks to Wall, causing the actuator to be damaged).
• In the case of TR jump other than to 100TR, the function shall continue to be processed even if the TR jump key is released. As for the CRG Move and 100TR Jump, the mechanism shall be set to the Tracking Close mode when the key is released.
• When the power is turned on/off the jump mode is reset to the Single TR (91) while the gain of the RFAMP is reset to 0 dB. At the same time all the self-adjusting values shall return to the default setting.

6.2 CHECKING THE GRATING AFTER CHANGING THE PICKUP UNIT

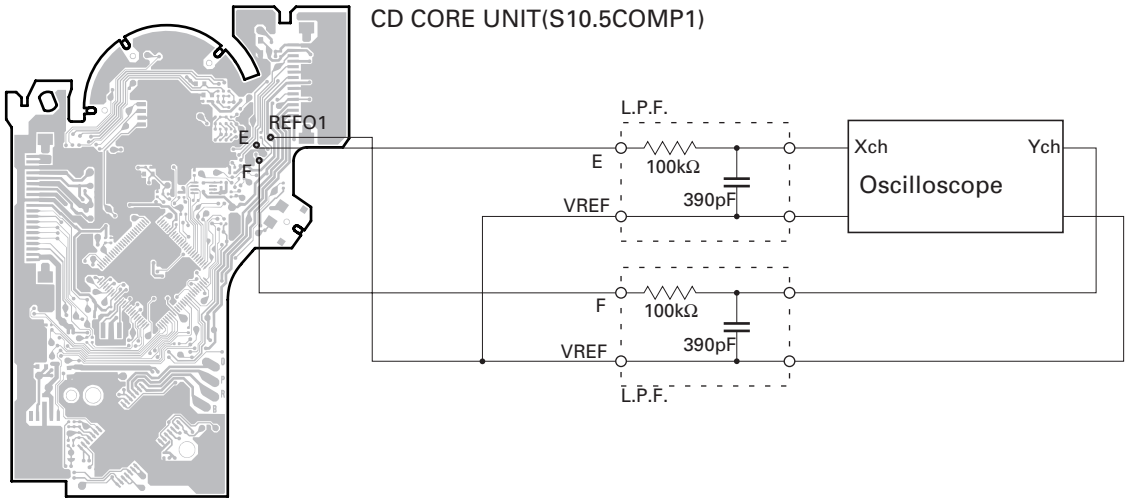
• **Note :**
The grating angle of the PU unit cannot be adjusted after the PU unit is changed. The PU unit in the CD mechanism module is adjusted on the production line to match the CD mechanism module and is thus the best adjusted PU unit for the CD mechanism module. Changing the PU unit is thus best considered as a last resort. However, if the PU unit must be changed, the grating should be checked using the procedure below.

• **Purpose :**
To check that the grating is within an acceptable range when the PU unit is changed.

• **Symptoms of Mal-adjustment :**
If the grating is off by a large amount symptoms such as being unable to close tracking, being unable to perform track search operations, or taking a long time for track searching.

• **Method :**

• Measuring Equipment	• Oscilloscope, Two L.P.F.
• Measuring Points	• E, F, REFO1
• Disc	• TCD-782
• Mode	• TEST MODE



• **Checking Procedure**
1. In test mode, load the disc and switch the 3V regulator on.
2. Using the → and ← buttons, move the PU unit to the innermost track.
3. Press key 3 to close focus, the display should read "91". Press key 2 to implement the tracking balance adjustment the display should now read "81". Press key 3. The display will change, returning to "81" on the fourth press.
4. As shown in the diagram above, monitor the LPF outputs using the oscilloscope and check that the phase difference is within 75° . Refer to the photographs supplied to determine the phase angle.
5. If the phase difference is determined to be greater than 75° try changing the PU unit to see if there is any improvement. If, after trying this a number of times, the grating angle does not become less than 75° then the mechanism should be judged to be at fault.

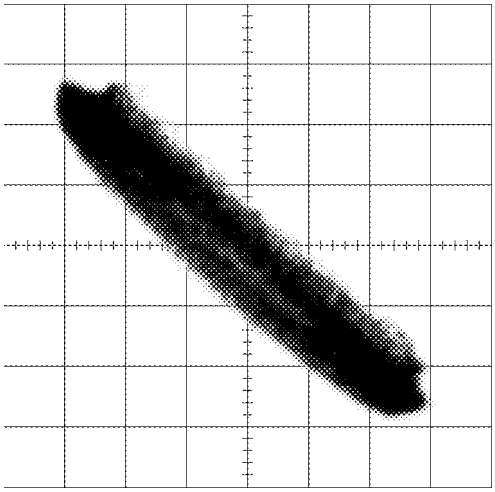
• **Note**
Because of eccentricity in the disc and a slight misalignment of the clamping center the grating waveform may be seen to "wobble" (the phase difference changes as the disc rotates). The angle specified above indicates the average angle.

• **Hint**
Reloading the disc changes the clamp position and may decrease the "wobble".

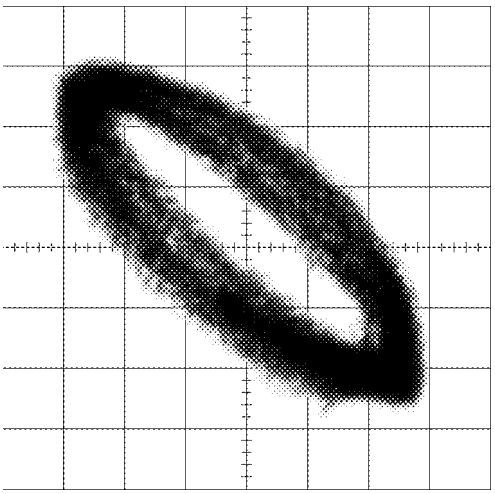
Grating waveform

Ech → Xch 20mV/div, AC
Fch → Ych 20mV/div, AC

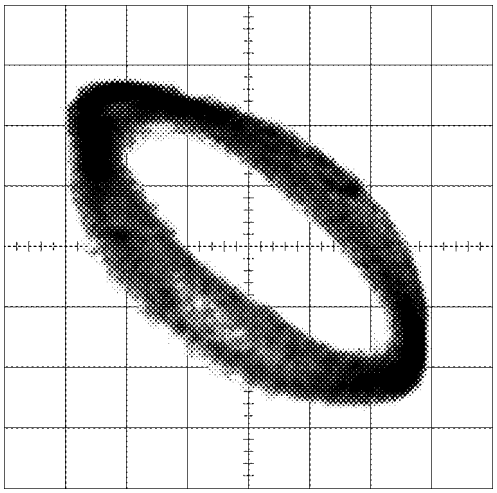
0°



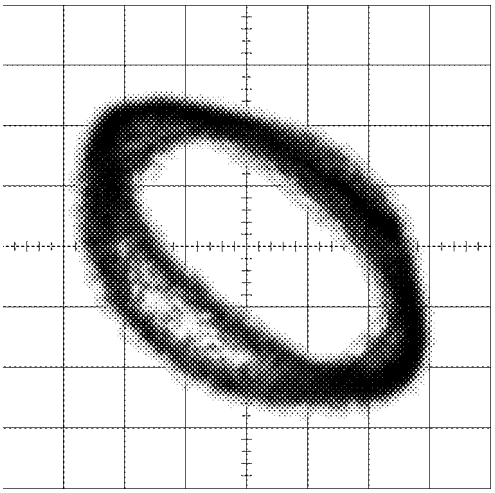
30°



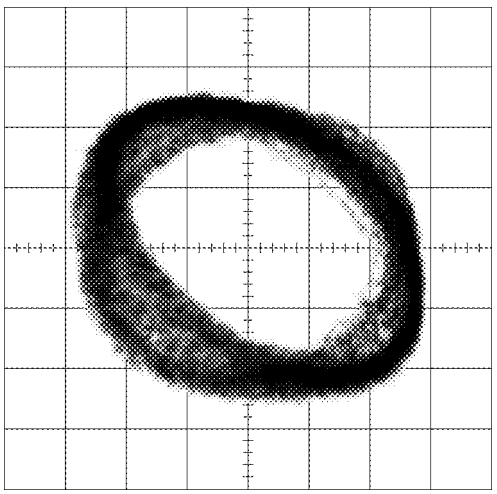
45°



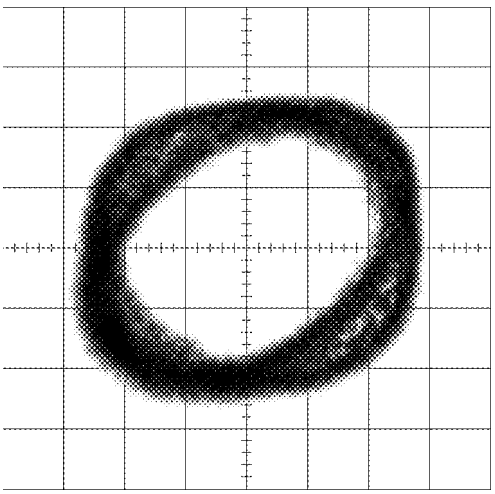
60°



75°



90°



6.3 ERROR MODE

● Error Messages

If a CD is not operative or stopped during operation due to an error, the error mode is turned on and cause(s) of the error is indicated with a corresponding number. This arrangement is intended at reducing nonsense calls from the users and also for facilitating trouble analysis and repair work in servicing.

(1) Basic Indication Method

1) When SERRORM is selected for the CSMOD (CD mode area for the system), error codes are written to DMIN (minutes display area) and DSEC (seconds display area). The same data is written to DMIN and DSEC. DTNO remains in blank as before.

2) Head unit display examples

Depending on display capability of LCD used, display will vary as shown below. xx contains the error number.

8-digit display	6-digit display	4-digit display
ERROR–xx	ERR–xx	E–xx

(2) Error Code List

Code	Class	Displayed error code	Description of the code and potential cause(s)
10	Electricity	Carriage Home NG SERVO LSI Communication Error	CRG can't be moved to inner diameter. CRG can't be moved from inner diameter. → Failure on home switch or CRG move mechanism. Communication error between microcomputer and SERVO LSI.
11	Electricity	Focus Servo NG	Focusing not available. → Stains on rear side of disc or excessive vibrations on REWRITABLE.
12	Electricity	Spindle Lock NG Subcode NG	Spindle not locked. Sub-code is strange (not readable). → Failure on spindle, stains or damages on disc, or excessive vibrations. A disc not containing CD-R data is found. Turned over disc are found, though rarely. CD signal error.
17	Electricity	Setup NG	AGC protection doesn't work. Focus can be easily lost. → Damages or stains on disc, or excessive vibrations on REWRITABLE.
30	Electricity	Search Time Out	Failed to reach target address. → CRG tracking error or damages on disc.
44	Electricity	ALL Skip	Skip setting for all track. (CD-R/RW)
50	Mechanism	CD On Mech Error	Mechanical error during CD ON. → Defective loading motor, mechanical lock and mechanical sensor.
A0	System	Power Supply NG	Power (VD) is ground faulted. → Failure on SW transistor or power supply (failure on connector).

Remarks: Mechanical errors are not displayed (because a CD is turned off in these errors).

Unreadable TOC does not constitute an error. An intended operation continues in this case.

Upper digits of an error code are subdivided as shown below:

1x: Setup relevant errors, 3x: Search relevant errors, Ax: Other errors.

6.4 SYSTEM MICROCOMPUTER TEST PROGRAM

● PCL output

In the normal operation mode (with the detachable panel installed, the ACC switched ON, the standby mode cancelled), shift the TESTIN IC601(Pin 88) terminal to H.
The clock signal is output from the PCL terminal IC601(Pin 39).
The frequency of the clock signal is 468 750 Hz that is one 32th of the fundamental frequency.
The clock signal should be 468 750 Hz(- 10 Hz, + 15 Hz).
If the clock signal is out of the range, the X'tal (X601) should be replaced with new one.

7. GENERAL INFORMATION

7.1 DIAGNOSIS

7.1.1 DISASSEMBLY

● **Removing the Case (not shown)**

1. Remove the Case.

● **Removing the CD Mechanism Module (Fig.1)**

1 Remove the four screws.

Disconnect the connector and then remove the CD Mechanism Module.

● **Removing the Grille Assy (Fig.1)**

2 Release the two latchs and then remove the Grille Assy.

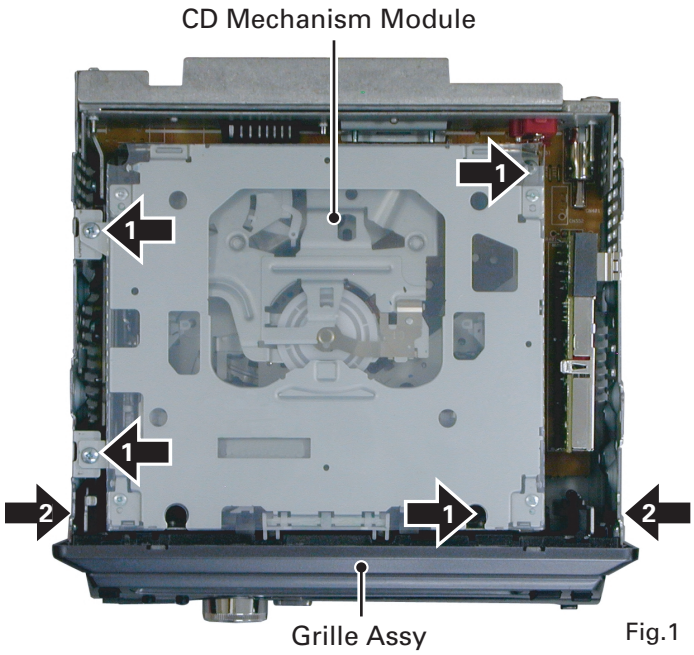


Fig.1

● **Removing the Tuner Amp Unit (Fig.2)**

1 Remove the screw.

2 Remove the three screws.

3 Straighten the tabs at three locations indicated.

4 Remove the screw and then remove the Tuner Amp Unit.

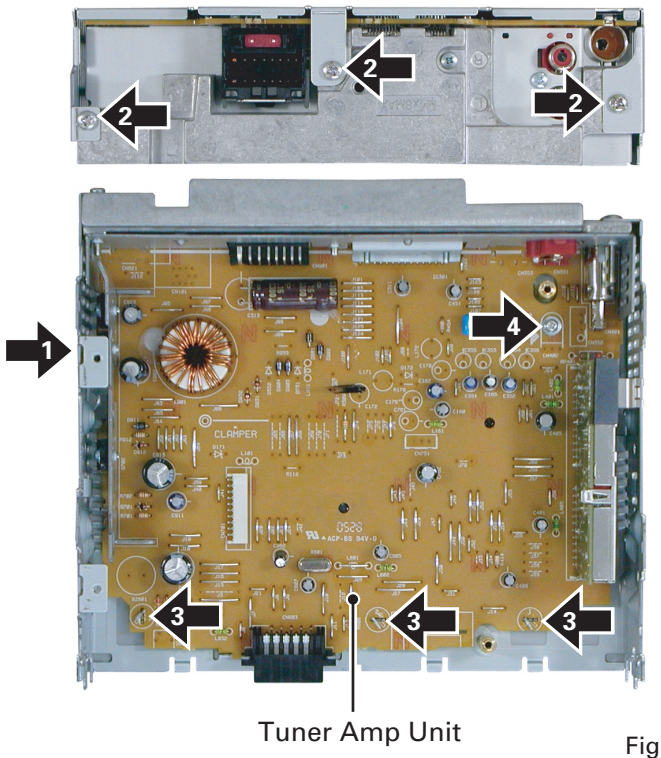
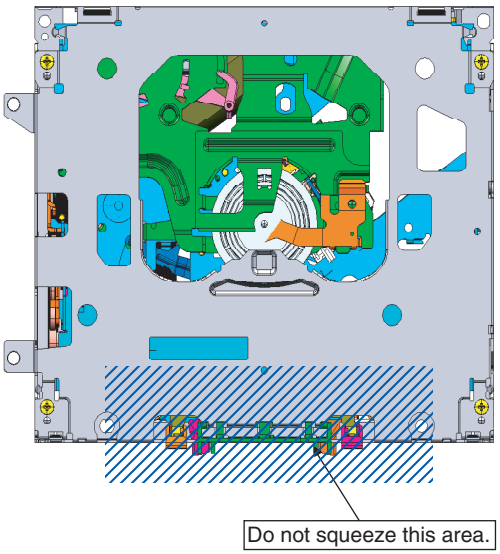


Fig.2

● How to hold the Mechanism Unit

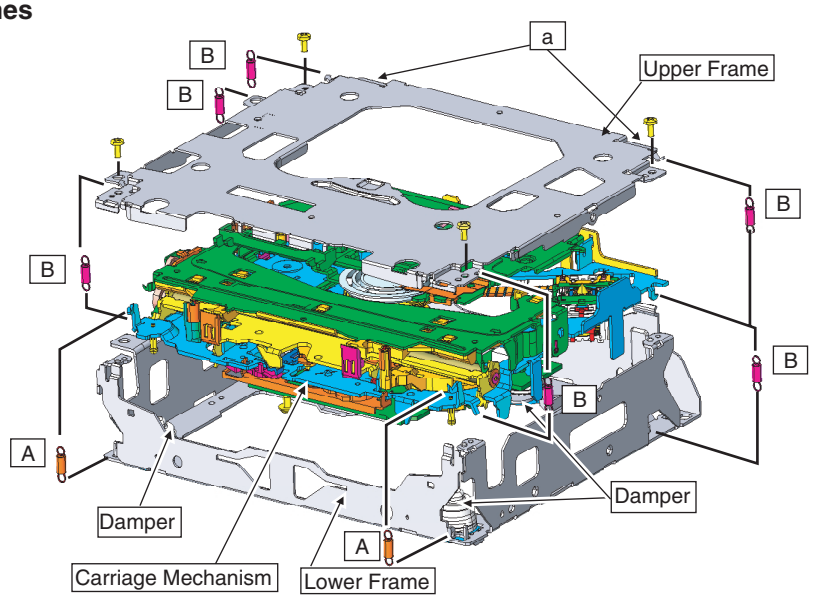
1. Hold the Upper and Lower Frames.
2. Do not hold the front portion of the Upper Frame, because it is not very solid.



● Removing the Upper and Lower Frames

1. With a disc inserted and clamped in the mechanism, remove the two Springs (A), the six Springs (B), and the four Screws.
2. Turn the Upper Frame using the part "a" as a pivot, and remove the Upper Frame.
3. While lifting the Carriage Mechanism, remove it from the three Dampers.

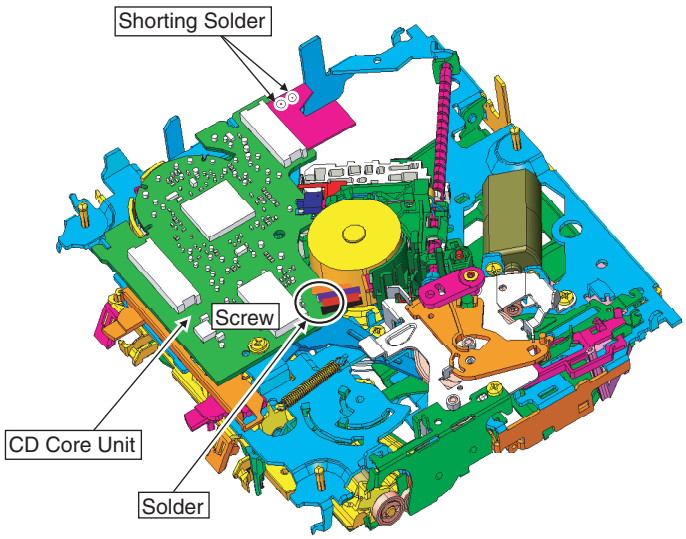
Caution: When assembling, be sure to apply some alcohol to the Dampers and assemble the mechanism in a clamped state.



● How to remove the CD Core Unit

1. Apply Shorting Solder to the flexible cable of the Pickup, and disconnect it from the connector.
2. Unsolder the four leads, and loosen the Screw.
3. Remove the CD Core Unit.

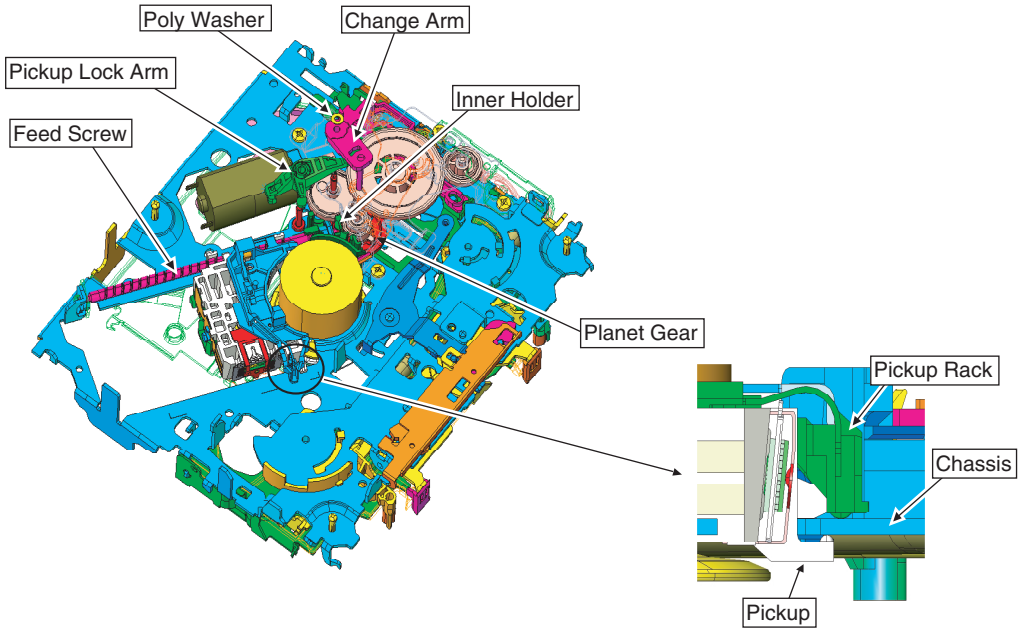
Caution: When assembling the CD Core Unit, assemble it with the SW in a clamped state so as not to damage it.



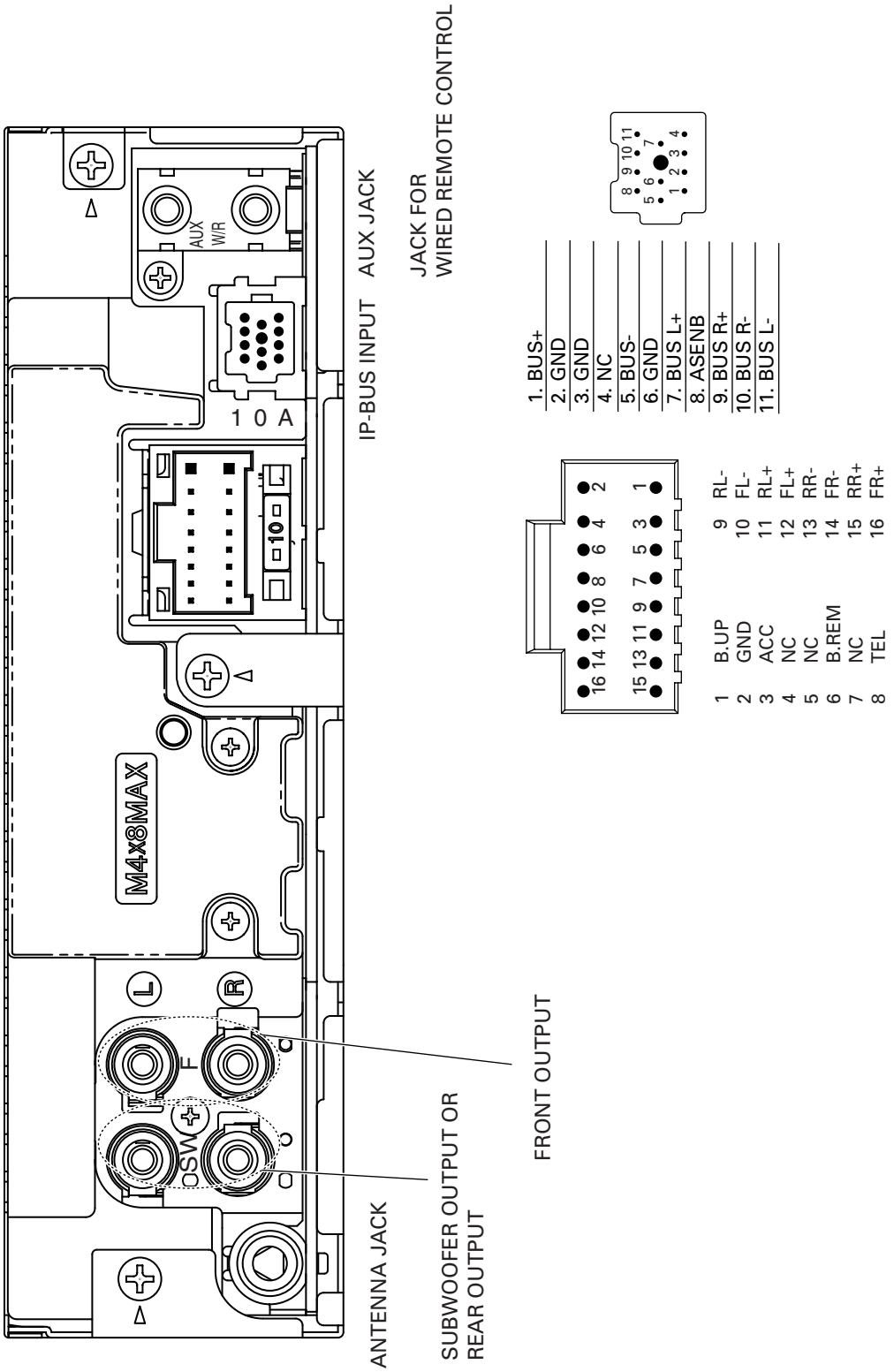
● How to remove the Pickup Unit

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Remove the CD Core Unit and remove the leads from the Inner Holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. While releasing from the hook of the Inner Holder, lift the end of the Feed Screw.

Caution: When assembling, move the Planet Gear to the load/eject position before setting the Feed Screw in the Inner Holder.
Assemble the sub unit side of the Pickup, taking the plate (Chassis) in-between. When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.



7.1.2 CONNECTOR FUNCTION DESCRIPTION



7.2 PARTS

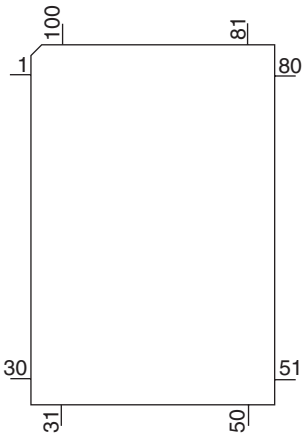
7.2.1 IC

● **Pin Functions (PEG156B)**

Pin No.	Pin Name	I/O	Format	Function and Operation
1	ILMPW	O	C	Illumination output
2	NC			Not used
3,4	ROT1,0	I		Rotary encoder pulse input 1,0
5,6	NC			Not used
7	SWVDD	O	C	GRILLE : Chip enable output
8	BYTE	I		External data bus width change input
9	CNVSS	I		Processor mode change input
10,11	NC			Not used
12	$\overline{\text{RESET}}$	I		Reset input
13	XOUT	O		Crystal oscillating element connection output
14	VSS	I		GND
15	XIN	I		Crystal oscillating element connection input
16	VCC	I		Power supply
17	$\overline{\text{NMI}}$	I	C	NMI input
18	$\overline{\text{DSENS}}$	I		Detach sense input
19	$\overline{\text{BSENS}}$	I		Back up sense input
20	$\overline{\text{ASENS}}$	I		ACC sense input
21	$\overline{\text{CD-RESET}}$	O	C	CD Mechanism Module : Reset output
22	NC			Not used
23	$\overline{\text{BRST}}$	O	C	P-BUS : Reset output
24	$\overline{\text{BRXEN}}$	I/O	C	P-BUS : RX enable input/output
25	$\overline{\text{BSRQ}}$	I		P-BUS : Slave service request input
26	NC			Not used
27	RX2	I		IP-BUS : Data input 2
28	NC			Not used
29	RX	I		IP-BUS : Data input
30	TX	O	N	IP-BUS : Data output
31	BSO	O	C	P-BUS : Serial output data
32	BSI	I		P-BUS : Serial input data
33	BSCK	O	C	P-BUS : Serial clock output
34	KEYD	I		Wired remote control key input
35	DPDT	O	C	GRILLE : Data output
36	KYDT	I		GRILLE : Data input
37	NC			Not used
38	TELIN	I		TEL mute input
39	PCL	O	C	Output for clock adjustment
40	ASENBO	O	C	IP-BUS : Slave ACC sense output
41-46	NC			Not used
47	DALMON	O	C	For consumption low-current output
48	SYSPW	O	C	System power control output
49-51	NC			Not used
52	IPPW	O	C	IP-BUS : Driver power supply control output
53	MUTE	O	C	Mute output
54	VST	O	C	E.VOL : Strobe output
55	VCK	O	C	E.VOL : Clock output
56	VDT	O	C	E.VOL : Data output
57	NC			Not used
58	ROMDATA	I/O	C	ROM correction : Data input/output
59	ROMCK	O	C	ROM correction : Clock output
60	ROMCS	O	C	ROM correction : Chip select output
61	NC			Not used
62	VCC	I		Power supply
63	NC			Not used
64	VSS	I		GND
65	$\overline{\text{CE2}}$	O	C	TUNER : Chip enable output(EEPROM)

Pin No.	Pin Name	I/O	Format	Function and Operation
66	CE1	O	C	TUNER : Chip enable output(PLL)
67	TUNPCK	O	C	TUNER : Clock output(PLL)
68	TUNPDI	I		TUNER : Data input(PLL)
69-73	NC			Not used
74	$\overline{\text{RCK}}$	I		RDS : Clock input
75	$\overline{\text{LDET}}$	I		RDS : PLL lock sense input
76-80	NC			Not used
81	$\overline{\text{RDS-LOCK}}$	I	C	RDS : Lock signal input
82	RDS-DATA	I	C	RDS : Data input
83	$\overline{\text{RDS-HSLK}}$	I	C	RDS : 57 kHz count pulse input
84	NC			Not used
85	RECIVE	O	C	Output for RDS circuit operation check
86	TUNPDO	O	C	TUNER : Data output(PLL)
87	NC			Not used
88	TESTIN	I		Test program input
89-91	NC			Not used
92	SSENS			Source key
93	NC			Not used
94	KEYAD	I		Wired remote control analog input
95	NC			Not used
96	AVSS	I		Analog GND
97	SL	I		Signal level input
98	VREF	I		Reference voltage
99	AVCC	I		Analog power supply
100	NC			Not used

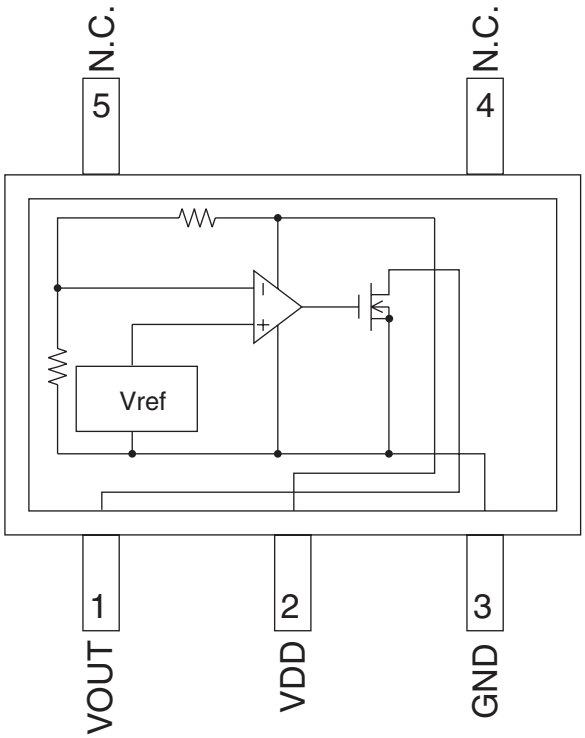
* PEG156B



IC's marked by * are MOS type.
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

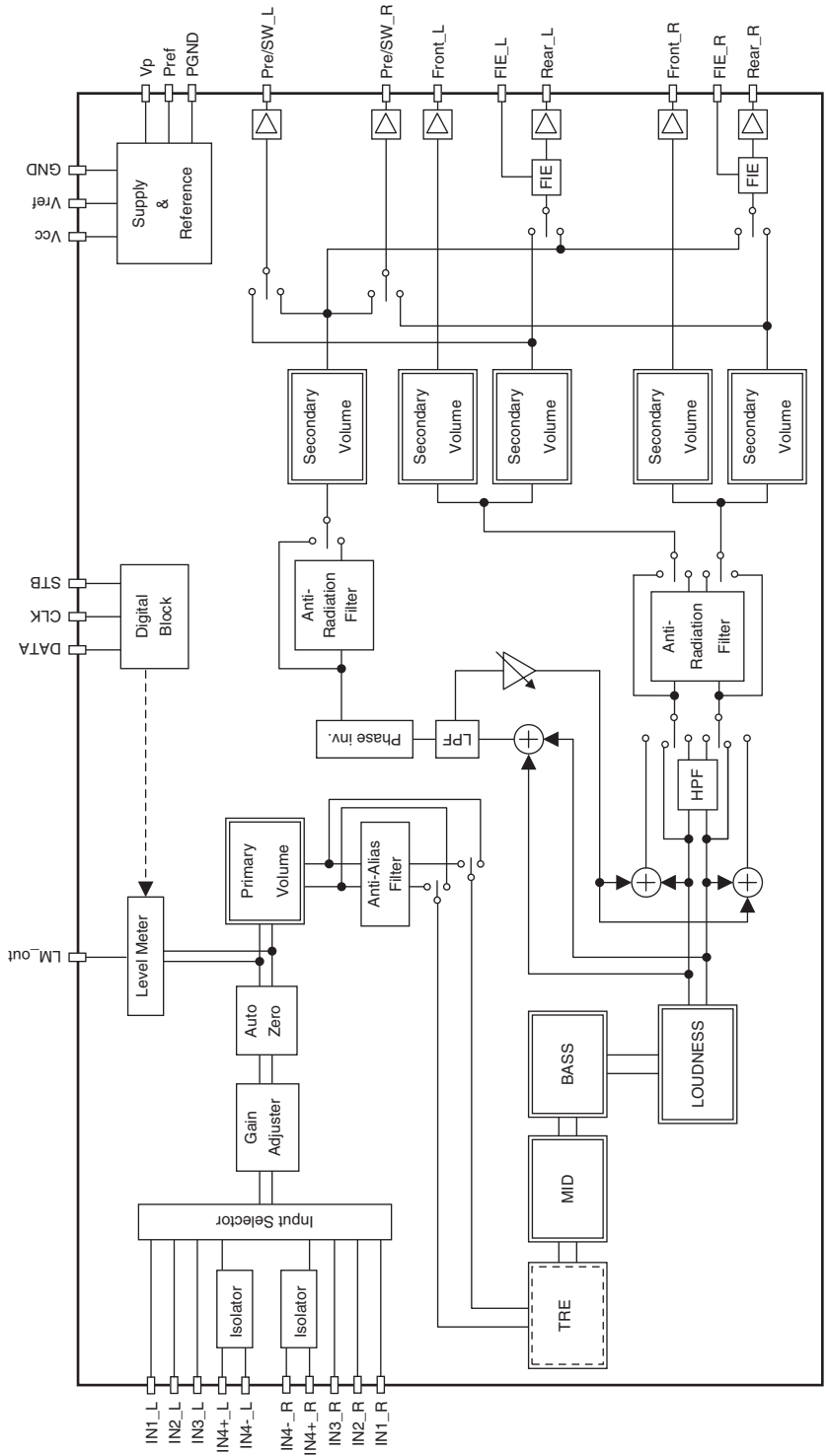
Format	meaning
C	C MOS
N	Nch open drain

BD4843G

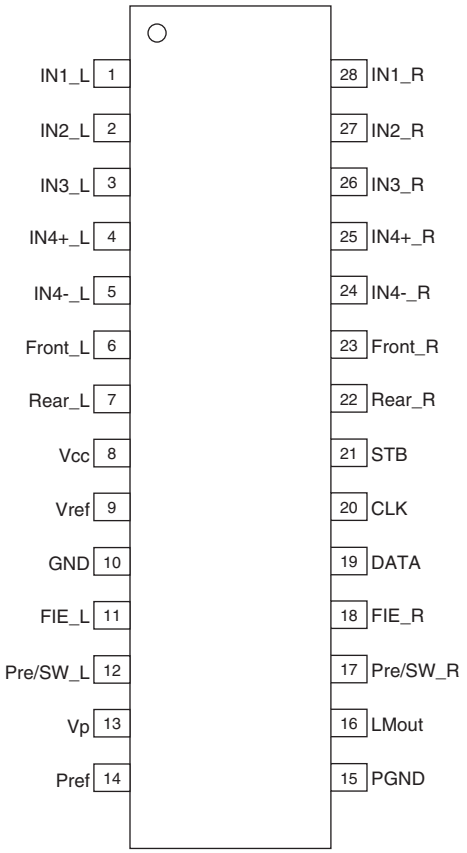


PML015A

● Block Diagram



● Pin Layout



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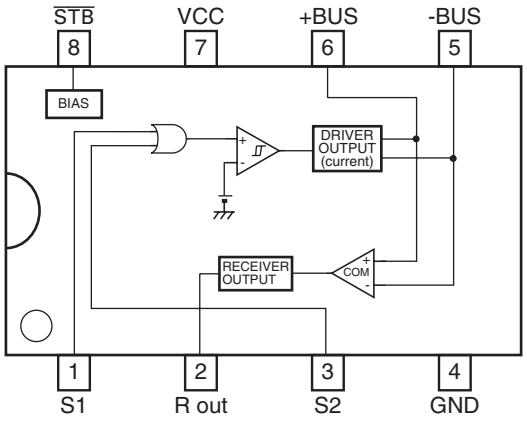

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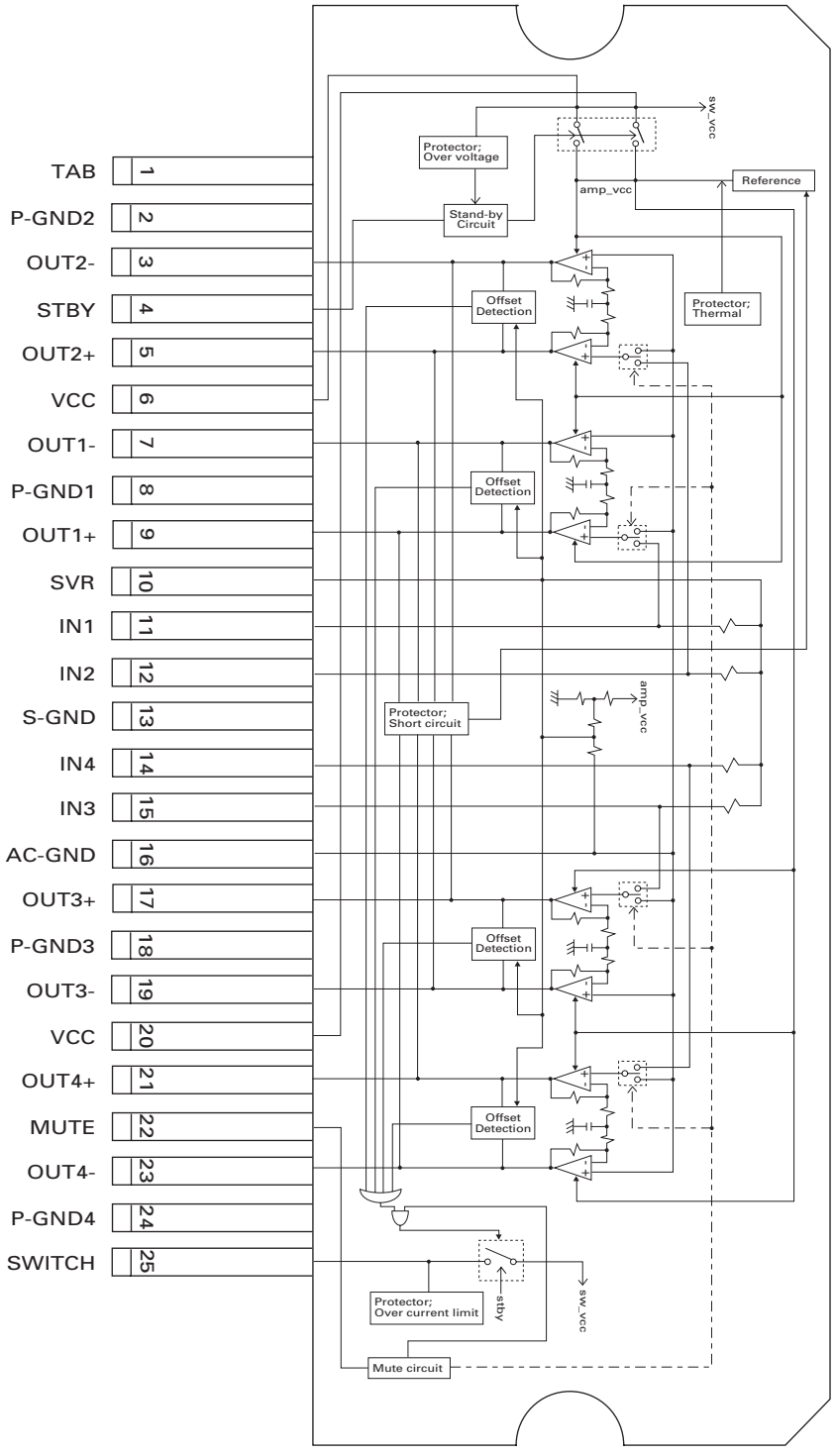

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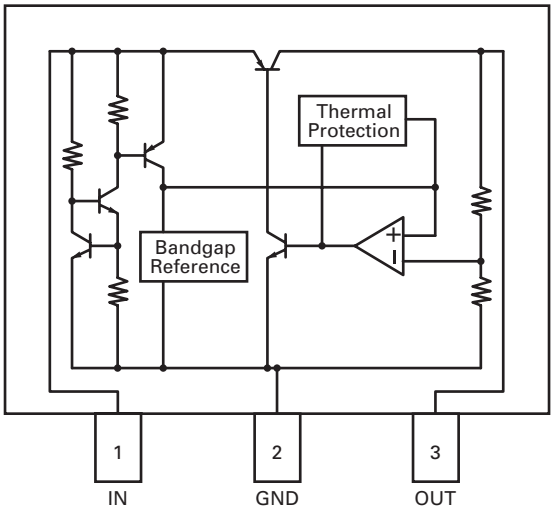

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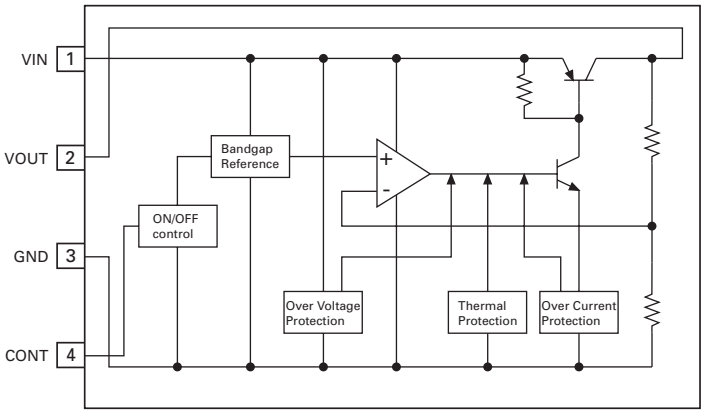
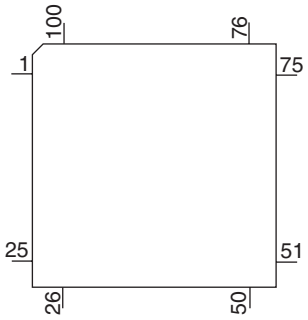


● Pin Functions (PD6538A)

Pin No.	Pin Name	I/O	Format	Function and Operation
1-39	SEG38-0	O		LCD segment output
40-43	COM3-0	O		LCD common output
44-46	V1-3	O		LCD drive power supply
47	VCC	O		Power supply
48	NC			Not used
49	TXD	O	C	Communication data output
50	RXD	I	C	Communication data input
51,52	MOD0,1			Not used
53	RESET			Reset
54,55	X0,1			Crystal oscillator connection pin
56	VSS			Not used
57	REM	I	C	Remote control input
58,59	NC			Not used
60-63	KDT4-1	I	C	Key data 4-1 output
64-69	KST6-1	O	N	Key strobe 6-1 output
70-100	SEG69-39	O		LCD segment output

* PD6538A



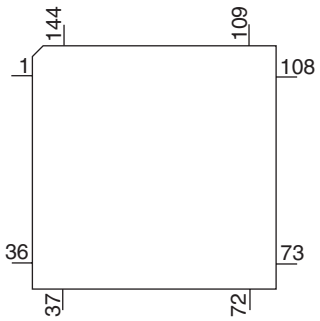
Format	meaning
C	C MOS
N	Nch open drain

● Pin Functions (UPD63763CGJ)

Pin No.	Pin Name	I/O	Function and Operation
1	D.VDD		Power supply for digital circuits
2	D1.GND		Ground for 1.6 V digital circuits
3	$\overline{\text{RESET}}$	I	Input of reset
4-8	AB12-8	I	Address bus 12-8 from the microcomputer
9-16	AD7-0	I/O	Address/data bus 7-0 to the microcomputer
17	$\overline{\text{CS}}$	I	Chip selection
18	ASTB	I	Address strobe
19	$\overline{\text{READ}}$	I	Control signals(read)
20	$\overline{\text{WRITE}}$	I	Control signals(write)
21	$\overline{\text{WAIT}}$	O	Control signals(wait)
22	INTQ	O	Interruption signals to the external microcomputer
23,24	IFMODE0,1	I	Switching the microcomputer I/F 0, 1
25	D1.VDD		Power supply for 1.6 V digital circuits
26	DA.VDD		Power supply for DAC
27	ROUT	O	Output of audio for the right channel
28	DA.GND		Ground for DAC
29	REGC		Connected to the capacitor for band gap
30	DA.GND		Ground for DAC
31	LOUT	O	Output of audio for the left channel
32	DA.VDD		Power supply for DAC
33	X.VDD		Power supply for the crystal oscillator
34	XTAL	I	Connected to the crystal oscillator(16.9344 MHz)
35	$\overline{\text{XTAL}}$	O	Connected to the crystal oscillator(16.9344 MHz)
36	X.GND		Ground for the crystal oscillator
37	VDDREG15		Control of 1.6 V regulator
38	PWMSW0	I	Setup 0 for PWM output(SD, MD)
39-41	TEST3-1	I	Connected to Ground
42	PWMSW1	I	Setup 1 for PWM output(FD, TD)
43	TESTEN	I	Connected to Ground
44	D1.GND		Ground for 1.6 V digital circuits
45	DIN	I	Input of audio data
46	DOUT	O	Output of audio data
47	SCKIN	I	Clock input for audio data
48	SCKO	O	Clock output for audio data
49	LRCKIN	I	Input of LRCK for audio data
50	LRCK	O	Output LRCK for audio data
51	$\overline{\text{XTALEN}}$	I	Permission to oscillate 16.9344 MHz
52	D1.VDD		Power supply for 1.6 V digital circuits
53	RFCK/HOLD	O	Output of RFCK/HOLD signal
54	WFCK/MIRR	O	Output of WFCK/MIRR signal
55	PLCK/RFOK	O	Output of PLCK/Output of RFOK
56	LOCK/RFOK	O	Output of LRCK/Output of RFOK
57	C1D1/C8M/(RA13)	O	Information on error correction/C8M : 8 MHz
58	C1D2/C16M/(RA12)	O	Information on error correction/C16M : 16 MHz
59	C2D1/RMUTE	O	Information on error correction/Mute for Rch
60	C2D2/LMUTE	O	Information on error correction/Mute for Lch
61	C2D3/SHOCK	O	Information on error correction/Detection of vibration
62	D1.GND		Ground for 1.6 V digital circuits
63	C33M	O	Output of 33.8688 MHz(CLK for SDRAM)
64	($\overline{\text{RCS}}$)	O	DRAM $\overline{\text{CS}}$
65	RA11	O	Output of DRAM address 11
66	(CKE)	O	Output of DRAM CKE
67	$\overline{\text{RAS}}$	O	Output of DRAM $\overline{\text{RAS}}$
68	$\overline{\text{CAS0}}$(LDQM)	O	Output of DRAM lower $\overline{\text{CAS}}$(LDQM)
69	$\overline{\text{CAS1}}$(UDQM)	O	Output of DRAM upper $\overline{\text{CAS}}$(UDQM)

Pin No.	Pin Name	I/O	Function and Operation
70	$\overline{WE}$	O	Output of DRAM $\overline{WE}$
71	$\overline{OE}$($\overline{CAS}$)	O	Output of DRAM $\overline{OE}$($\overline{CAS}$)
72	D.GND		Ground for digital circuits
73-88	RDB0-15	I/O	Input/output of DRAM data0-15
89-99	RA0-10	O	Output of DRAM address0-10
100	D.VDD		Power supply for digital circuits
101	FD+	O	Output of focus drive PWM +
102	FD-	O	Output of focus drive PWM -
103	TD+	O	Output of tracking drive PWM +
104	TD-	O	Output of tracking drive PWM -
105	SD+	O	Output of thread drive PWM +
106	SD-	O	Output of thread drive PWM -
107	MD+	O	Output of spindle drive PWM +
108	MD-	O	Output of spindle drive PWM -
109	REFOUTSV	O	REFOUT for servo
110	AD.VDD		Power supply for ADC
111	EFM	O	Output of EFM signals
112	ASY	I	Input of asymmetry
113	ATEST	O	Analog tests
114	RFI	I	Input of RF
115	AD.GND		Ground for the analog system
116	AGCO	O	Output of RF
117	C3T	O	Connection to the capacitor for detecting 3T
118	AGCI	I	Input of AGC
119	RFO	O	Output of RF(AGC)
120,121	EQ2,1	I	Equalizer 2, 1
122	RF2-	I	Reversal input of RF2
123	RF-	I	Reversal input of RF
124	A.GND		Ground for the analog system
125	A	I	Input of A
126	C	I	Input of C
127	B	I	Input of B
128	D	I	Input of D
129	F	I	Input of F
130	E	I	Input of E
131	VREFIN	I	Input of reference voltage
132	A.VDD		Power supply for the analog system
133	REFOUT	O	Output of reference voltage
134	REFC	I	Connected to the capacitor for output of REFOUT
135	FE-	I	Reversal input of FE
136	FEO	O	Output of FE
137	ADIN	I	Input of FE, TE A/D converter
138	TE-	I	Reversal input of TE
139	TEO	O	Output of TE
140	TE2	O	TE2
141	TEC	I	TEC
142	LD	O	Output of LD
143	PD	I	Input of PD
144	D.GND		Ground for digital circuits

* UPD63763CGJ

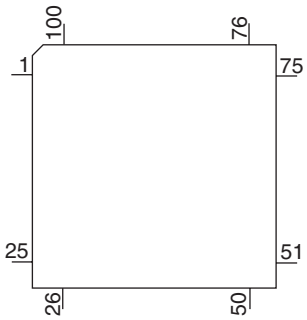


● Pin Functions (PE5505A)

Pin No.	Pin Name	I/O	Format	Function and Operation
1	AVREF			A power supply / Positive power supply(5V)
2	AVSS			A power supply GND
3	$\overline{\text{TESTIN}}$	I		Chip check test program starting input
4	CLAMP			Not used
5	EVDD			E power supply / Positive power supply
6	FMODE			For flash rewriting / L : flash rewriting mode
7	FLRQ			For flash rewriting / Reset voltage control
8	IC/FLMD0			IC : VSS direct connection/FLMOD0 : Pull-down
9	VDD			Positive power supply(5V)
10	REGC			Connected to the capacity stabilizing output of the regulator
11	VSS			GND
12	X1	I		Oscillator connection for mainclock
13	X2			Oscillator connection for mainclock
14	$\overline{\text{RESET}}$	I		System reset input
15	XT1	I		Connected to the oscillator for subclock(connected to VSS via the resistor)
16	XT2			Connected to the oscillator for subclock(Open)
17	PULLDOWN	I		Connected to EVDD or EVSS via the resistor
18	$\overline{\text{EJSW}}$			Not used
19	$\overline{\text{XINT}}$	I	C	CD LSI interruption signal input
20	NC			Not used
21	$\overline{\text{BRST}}$	I		Bus reset input
22	BSI	I		Bus serial data input
23	BSO	O	C	Bus serial data output
24	$\overline{\text{BSCK}}$	I/O	/C	Bus serial clock input/output
25	FTxD	O	C	For flash rewriting(transmitted signal)
26	FRxD	I		For flash rewriting(received signal)
27	BRXEN	I/O	/C	Bus RX enable input/output
28	$\overline{\text{BSRQ}}$	I/O	/C	Bus serial clock input/output
29	$\overline{\text{DSPOK}}$			Not used
30	DSCSNS	I	C	Disc state sense input
31	8EJ(S905)	I	C	input of detection of 8 cm disc ejection
32	12EJ(S904)	I	C	input of detection of 12 cm disc ejection
33	EVSS			E power supply GND
34	EVDD			E power supply / Positive power supply
35,36	SRAMLEVEL0,1	O		SRAM level meter output
37	EMPH	O	C	Emphasis information output
38	$\overline{\text{EMPH}}$			Not used
39	CDMUTE			Not used
40	LOEJ			Not used
41	CLCONT	O		Driver input switching output
42	HOME	I		Home SW sense input
43	$\overline{\text{ADENA}}$	O	C	A/D reference voltage supply control output
44	LRCKOK	O	C	(DOUT mute output)
45	SRAMLEVEL2	O	C	SRAM level meter output
46	CD3VON(MCKRQ)	O	C	CD + 3.3 V power supply control output(Digital output : MCKRQ)
47	CONT	O	C	Servo driver power supply control output
48	$\overline{\text{XRST}}$	O	C	CD LSI reset control output
49	VDCONT	O	C	VD power supply control output
50	$\overline{\text{XSI}}$	I		CD LSI serial data input
51	$\overline{\text{XSO}}$	O	C	CD LSI serial data output
52	$\overline{\text{XCK}}$	O	C	CD LSI serial clock output
53	$\overline{\text{XWAIT}}$	I	C	CD LSI wait control signal input
54	XASTB	O	C	CD LSI address strobe output
55	AD0	O	C	Address/data Bus 0
56	INT			Not used

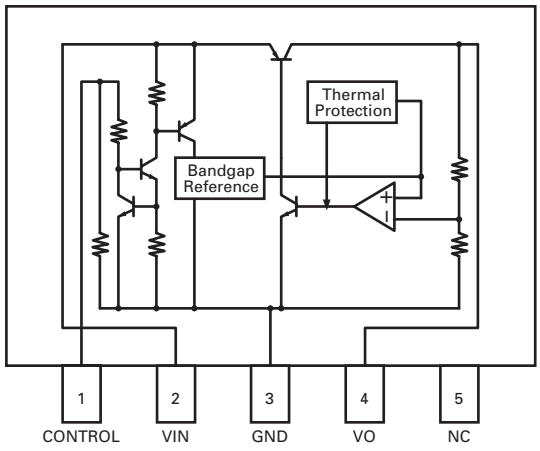
Pin No.	Pin Name	I/O	Format	Function and Operation
57	ROMDATA	I/O		E2PROM data input/output
58	ROMCK	O		E2PROM clock output
59	ROMCS	O	C	E2PROM chip selection output
60,61	NC			Not used
62	CLKOUT			Not used
63	LOCK	I		Spindle lock input
64-68	NC			Not used
69	BVSS			B power supply GND
70	BVDD			B power supply / Positive power supply
71-75	NC			Not used
76	FLMD1	I/O	/C	Address/Data Bus 5
77-90	NC			Not used
91-93	A/D			Not used
94	$\overline{\text{CSENS}}$			Not used
95	TYPE_A/D			Not used
96,97	NC			Not used
98	TEMP			Not used
99	VDSENS	I		VD power supply short sense input
100	DSCSNS			Not used

* PE5505A

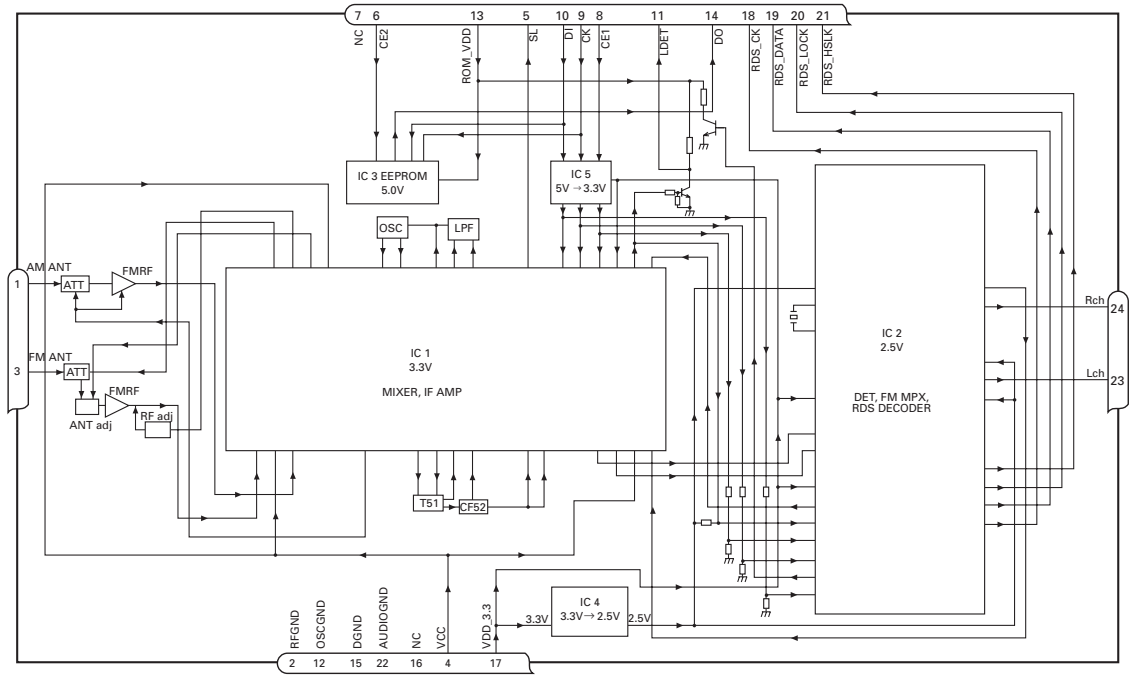


Format	meaning
C	C MOS

NJM2886DL3-33



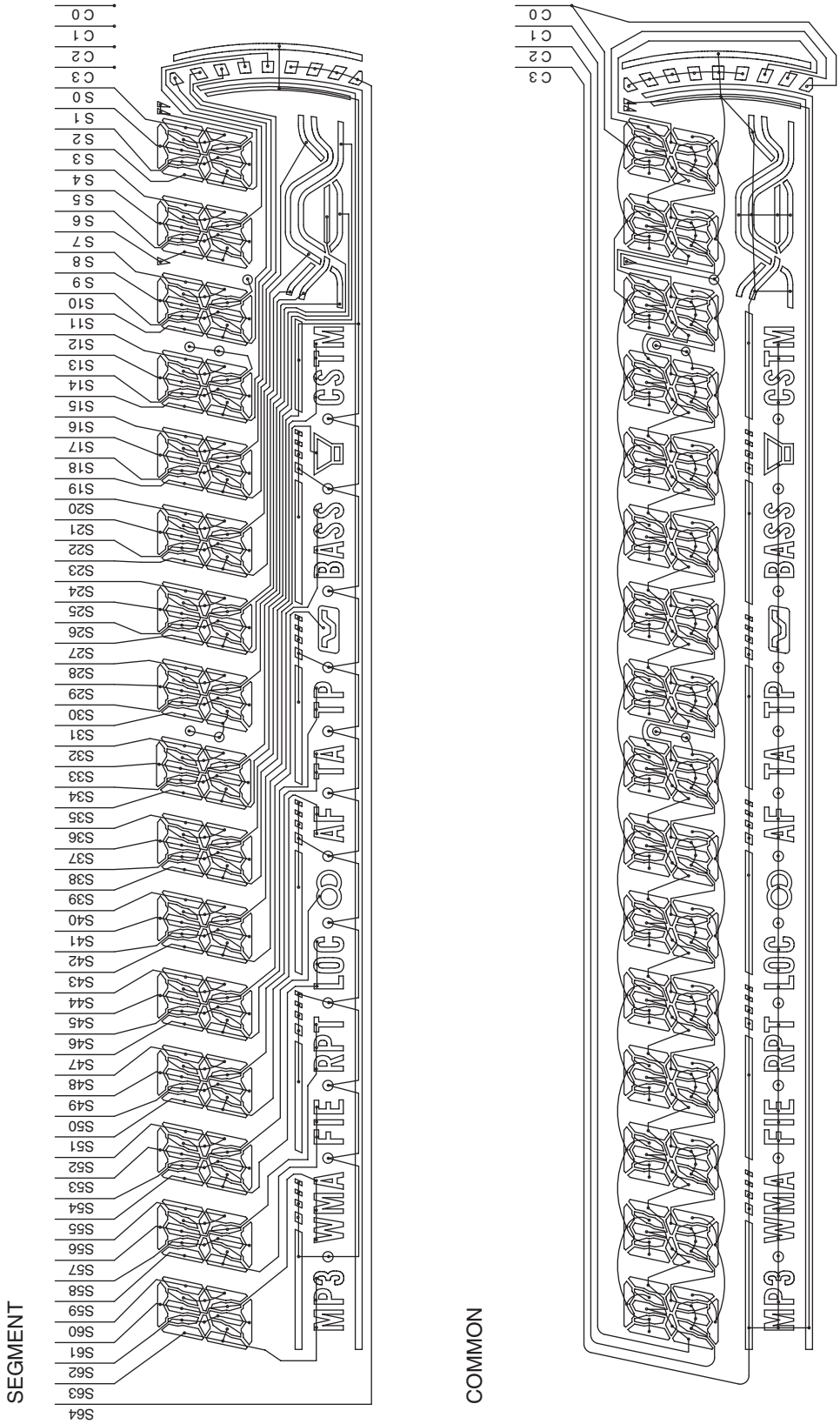
● FM/AM Tuner Unit



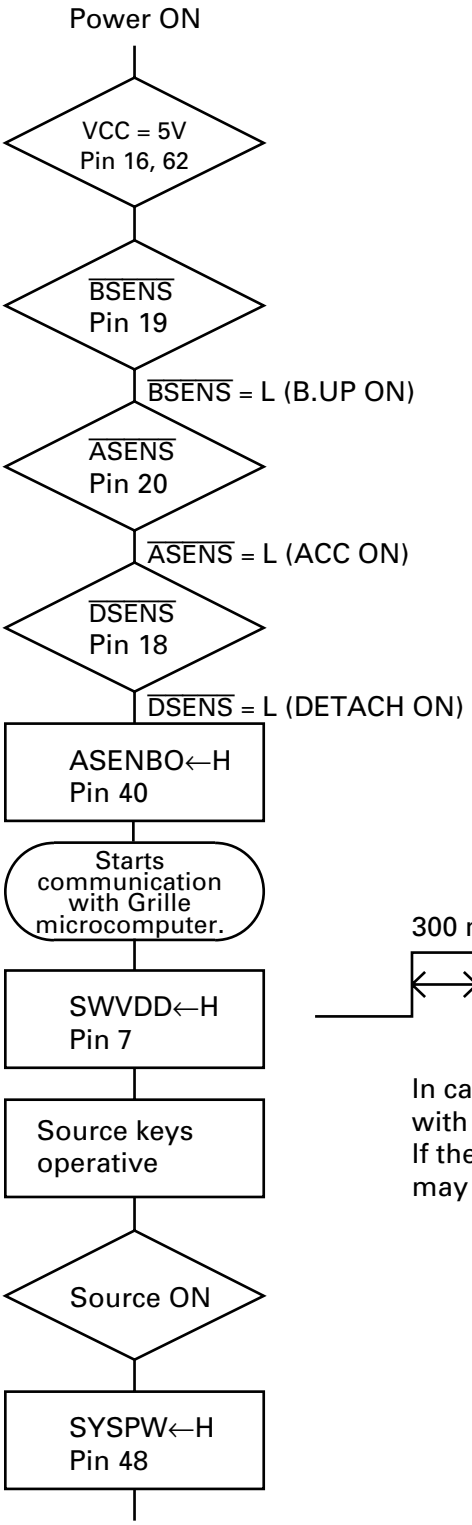
No.	Symbol	I/O	Explain	
1	AMANT	I	AM antenna input	AM antenna input high impedance AMANT pin is connected with an all antenna by way of 4.7μH. (LAU type inductor) A series circuit including an inductor and a resistor is connected with RF ground for the countermeasure against the hum of power transmission line.
2	RFGND		RF ground	Ground of antenna block
3	FMANT	I	FM antenna input	Input of FM antenna 75Ω Surge absorber(DSP-201M-S00B) is necessary.
4	VCC		power supply	The power supply for analog block. D.C 8.4V ± 0.3V
5	SL	O	signal level	Output of FM/AM signals level
6	CE2	I	chip enable-2	Chip enable for EEPROM "Low" active
7	NC		non connection	Not used
8	CE1	I	chip enable-1	Chip enable for AF•RF "High" active
9	CK	I	clock	Clock
10	DI	I	data in	Data input
11	LDET	O	lock detector	"Low" active
12	OSCGND		osc ground	Ground of oscillator block
13	ROM_VDD		power supply	Power supply for EEPROM pin 13 is connected with a power supply of micro computer.
14	DO	O	data out	Data output
15	DGND		digital ground	Ground of digital block
16	NC		non connection	Not used
17	VDD_3.3		power supply	The power supply for digital block. 3.3V ± 0.2V
18	RDS_CK	O	RDS clock	Output of RDS clock(2.5V)
19	RDS_DATA	O	RDS data	Output of RDS data(2.5V)
20	RDS_LOCK	O	RDS lock	Output unit "High" active(2.5V) (RDS_LOCK turns over by the external transistor. "Low" active)
21	RDS_HSLK	O	RDS high speed lock	Output unit "High" active(2.5V)(RDS_HSLK turns over by the external transistor. "Low" active)
22	AUDIOGND		audio ground	Ground of audio block
23	L ch	O	L channel output	FM stereo "L-ch" signal output or AM audio output
24	R ch	O	R channel output	FM stereo "R-ch" signal output or AM audio output

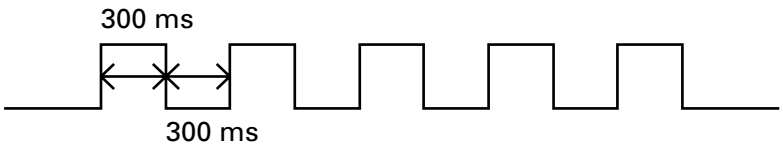
7.2.2 DISPLAY

● **LCD(YAW5054)**



7.3 OPERATIONAL FLOW CHART

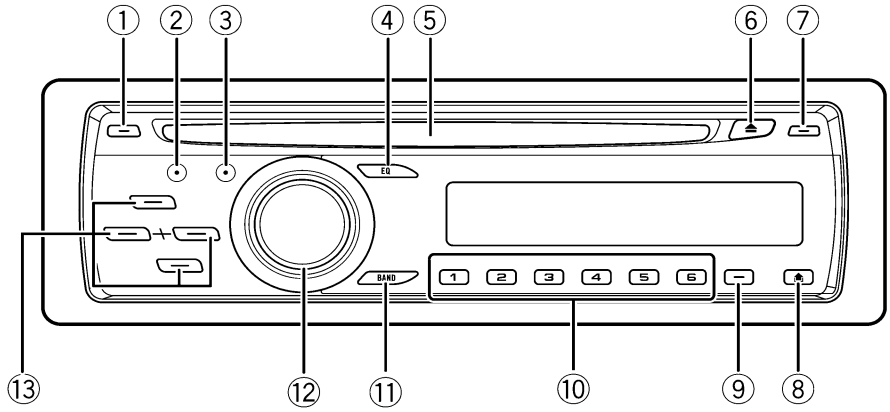




In case of the above signal, the communication with Grille microcomputer may fail.
If the time interval is not 300 msec, the oscillator may be defective.

Completes power-on operation.
(After that, proceed to each source operation)

8. OPERATIONS



Head unit

① **TA button**
Press to turn TA function on or off. Press and hold to turn AF function on or off.

② **AUDIO button**
Press to select various sound quality controls.

③ **FUNCTION button**
Press to select functions.

④ **EQ button**
Press to select various equalizer curves.

⑤ **Disc loading slot**
Insert a disc to play.

⑥ **EJECT button**
Press to eject a CD from your built-in CD player.

⑦ **DISPLAY button**
Press to select different displays.

⑧ **DETACH button**
Press to remove the front panel from the head unit.

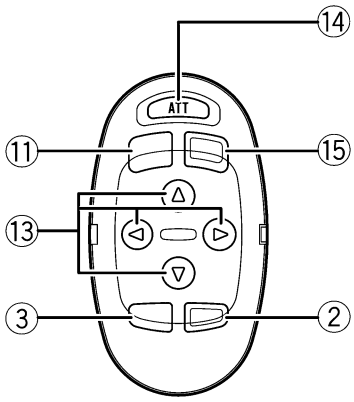
⑨ **SW button**
Press to select the subwoofer setting menu. Press and hold to select the bass boost setting menu.

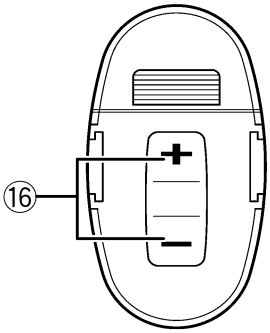
⑩ **1–6 buttons**
Press for preset tuning and disc number search when using a multi-CD player.

⑪ **BAND button**
Press to select among three FM bands and MW/LW bands and to cancel the control mode of functions.

⑫ **SOURCE button, VOLUME**
This unit is turned on by selecting a source. Press to cycle through all the available sources.
Rotate it to increase or decrease the volume.

⑬ **▲/▼/◄/► buttons**
Press to perform manual seek tuning, fast forward, reverse and track search controls. Also used for controlling functions.▣





Optional remote control

The steering remote control CD-SR100 is sold separately.

Operation is the same as when using the buttons on the head unit. See the explanation of the head unit about the operation of each button with the exception of **ATT**, which is explained below.

⑭ ATT button

Press to quickly lower the volume level, by about 90%. Press once more to return to the original volume level.

⑮ SOURCE button

Press to cycle through all the available sources. Press and hold to turn the source off.

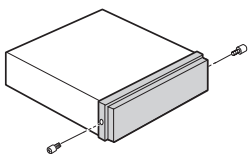
⑯ VOLUME button

Press to increase or decrease the volume.

Fixing the Front Panel

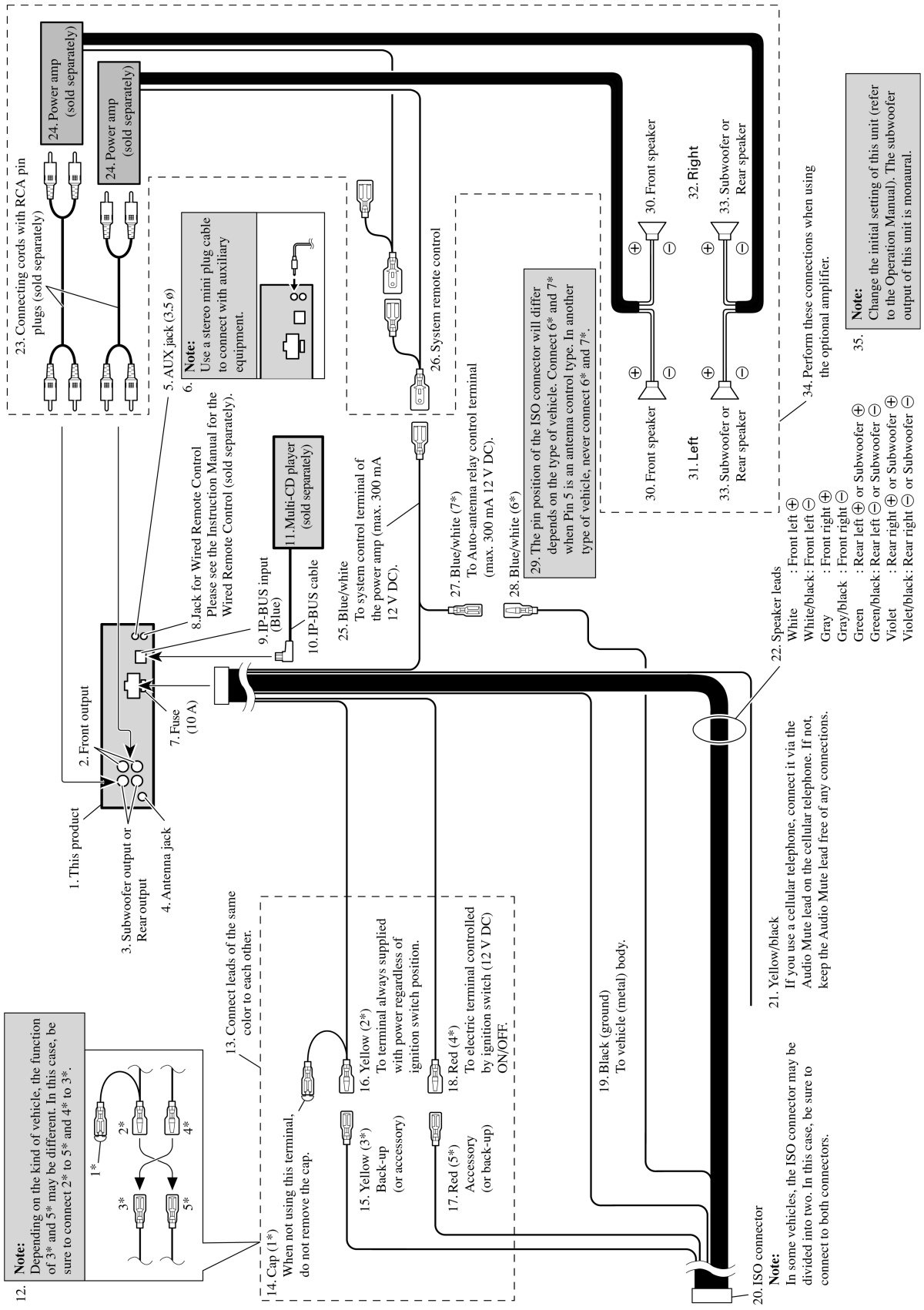
If you do not operate the removing and attaching the front panel function, use the supplied fixing screws to fix the front panel to this unit.

1. Fix the front panel to the unit using fixing screws.



Fixing screw
(CBA1994)

●CONNECTION DIAGRAM


1. This product
2. Front output
3. Subwoofer output or Rear output
4. Antenna jack
5. AUX jack (3.5 ø)
6. Note: Use a stereo mini plug cable to connect with auxiliary equipment.
7. Fuse (10 A)
8. Jack for Wired Remote Control Please see the Instruction Manual for the Wired Remote Control (sold separately).
9. IP-BUS input (Blue)
10. IP-BUS cable
11. Multi-CD player (sold separately)
12. Note: Depending on the kind of vehicle, the function of 3* and 5* may be different. In this case, be sure to connect 2* to 5* and 4* to 3*.
13. Connect leads of the same color to each other.
14. Cap (1*) When not using this terminal, do not remove the cap.
15. Yellow (3*) Back-up (or accessory)
16. Yellow (2*) To terminal always supplied with power regardless of ignition switch position.
17. Red (5*) Accessory (or back-up)
18. Red (4*) To electric terminal controlled by ignition switch (12 V DC) ON/OFF.
19. Black (ground) To vehicle (metal) body.
20. ISO connector Note: In some vehicles, the ISO connector may be divided into two. In this case, be sure to connect to both connectors.
21. Yellow/black If you use a cellular telephone, connect it via the Audio Mute lead on the cellular telephone. If not, keep the Audio Mute lead free of any connections.
22. Speaker leads
White : Front left ⊕
White/black : Front left ⊖
Gray : Front right ⊕
Gray/black : Front right ⊖
Green : Rear left ⊕ or Subwoofer ⊕
Green/black : Rear left ⊖ or Subwoofer ⊖
Violet : Rear right ⊕ or Subwoofer ⊕
Violet/black : Rear right ⊖ or Subwoofer ⊖
23. Connecting cords with RCA pin plugs (sold separately)
24. Power amp (sold separately)
24. Power amp (sold separately)
25. Blue/white To system control terminal of the power amp (max. 300 mA 12 V DC).
26. System remote control
27. Blue/white (7*) To Auto-antenna relay control terminal (max. 300 mA 12 V DC).
28. Blue/white (6*)
29. The pin position of the ISO connector will differ depends on the type of vehicle. Connect 6* and 7* when Pin 5 is an antenna control type. In another type of vehicle, never connect 6* and 7*.
30. Front speaker
31. Left
32. Right
33. Subwoofer or Rear speaker
33. Subwoofer or Rear speaker
30. Front speaker
34. Perform these connections when using the optional amplifier.
35. Note: Change the initial setting of this unit (refer to the Operation Manual). The subwoofer output of this unit is monaural.

● Jigs List

Name	Jig No.	Remarks
Test Disc	TCD-782	Checking the grating
L.P.F.		Checking the grating (Two pieces)

● Grease List

Name	Jig No.	Remarks
Grease	GEM1024	CD Mechanism Module
Grease	GEM1045	CD Mechanism Module

Before shipping out the product, be sure to clean the following portions by using the prescribed cleaning tools:

Portions to be cleaned	Cleaning tools
CD pickup lenses	Cleaning liquid : GEM1004 Cleaning paper : GED-008

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Service Manual

ORDER NO.
CRT3583

CD MECHANISM MODULE(S10.5COMP1)

CX-3164

This service manual describes the operation of the CD mechanism module incorporated in models listed in the table below.
When performing repairs use this manual together with the specific manual for model under repair.

Model	Service Manual	CD Mechanism Module
DEH-2800MP/XN/UC DEH-2850MP/XN/ES	CRT3554	CXK5752
DEH-2800MP/XN/EW DEH-2800MPB/XN/EW DEH-2820MP/XN/EW DEH-281MP/XN/EW	CRT3555	CXK5752
DEH-3850MP/XU/ES DEH-3850MPH/XU/GS DEH-3850MP/XU/CN	CRT3556	CXK5750
DEH-P3800MP/XU/UC	CRT3557	CXK5750
DEH-P4800MP/XU/EW	CRT3558	CXK5750
DEH-P580MP/XN/UC DEH-P5800MP/XN/UC	CRT3563	CXK5752
DEH-P6800MP/XN/EW	CRT3564	CXK5752
DEH-P5850MP/XN/ES DEH-P5850MPH/XN/GS	CRT3565	CXK5752
DEH-P480MP/XU/UC DEH-P4800MP/XU/UC	CRT3566	CXK5750
DEH-P4850MP/XU/ES DEH-P4850MPH/XU/GS DEH-P4850MP/XU/CN	CRT3567	CXK5750
DEH-P680MP/XN/UC DEH-P6800MP/XN/UC DEH-P6850MP/XN/ES	CRT3569	CXK5752

PIONEER CORPORATION 4-1, Meguro 1-chome, Meguro-ku, Tokyo 153-8654, Japan
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PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 253 Alexandra Road, #04-01, Singapore 159936
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K-ZZA. OCT. 2005 Printed in Japan

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1. CIRCUIT DESCRIPTIONS

UPD63763CGJ, multifunctional LSI used in this device, has built-in CD-ROM decoder and MP3/WMA decoder, as shown in Fig.1.0.1, as well as the conventional CD block, allowing to play CD-ROMs, in which MP3/WMA files are recorded, while the recent mainstay of the CD LSI is the LSI integrating the core DSP with DAC or RF amplifier, which are generally used as peripheral circuits.

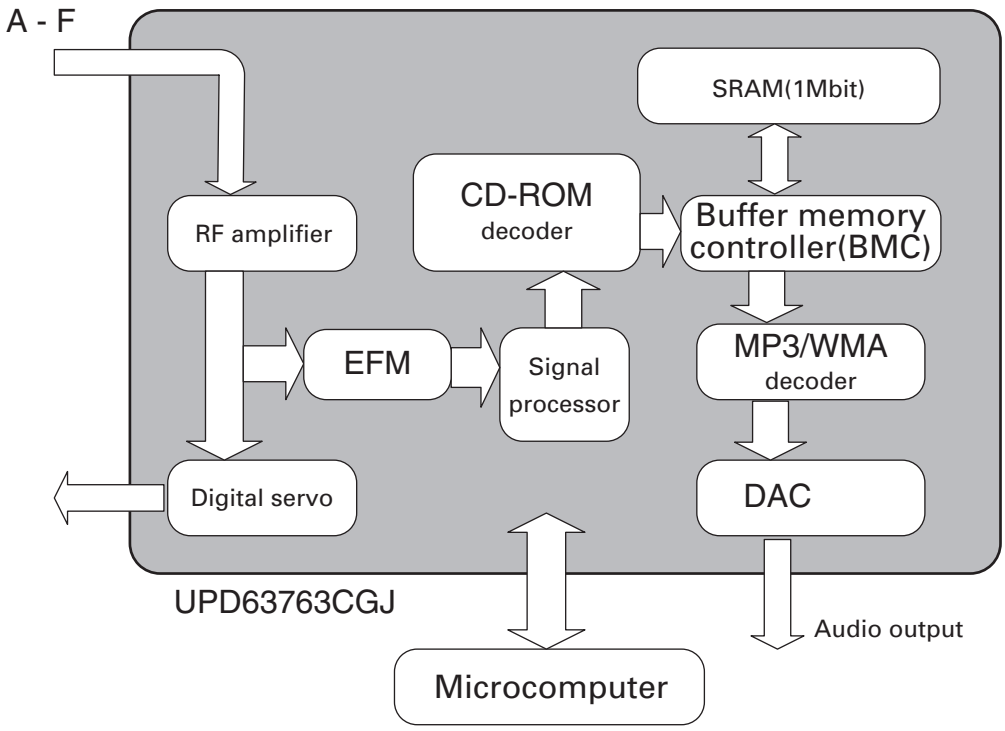


Fig.1.0.1 Block diagram of CD LSI UPD63763CGJ

1.1 PREAMPLIFIER BLOCK (UPD63763CGJ: IC201)

In the preamplifier block, the pickup output signals are processed to generate signals that are used in the subsequent blocks: servo, demodulator, and control blocks. Signals from the pickup are I/V converted in the pickup with the preamplifier with built-in photo detectors, and after added with the RF amplifier, they are used to produce such signals as RF, FE, TE, and TE zero-cross signals. The preamplifier block is built in CD LSI UPD63763CGJ (IC201), whose parts are described individually below. Incidentally, as this LSI employs a single power supply (+ 3.3 V) specification, the reference voltages of this LSI and the pickup are the REFO (1.65 V) for both. The REFO is an output obtained from REFOUT in the LSI via the buffer amplifier, and is output from the pin 133 of this LSI. All measurements will be performed with this REFO as the reference.

Caution: Be careful not to short-circuit the REFO and GND when measuring.

1.1.1 APC (Automatic Power Control) circuit

Since laser diodes have extremely negative temperature characteristics in optical output when driven in constant current, it is necessary to control the current with the monitor diodes in order to keep the output constant. This is the feature of the APC circuit. The LD current is obtained by measuring the voltage between LD1 and V3R3D(+ 3.3 V), and divide the value by 7.5 (ohms), which becomes about 30 mA.

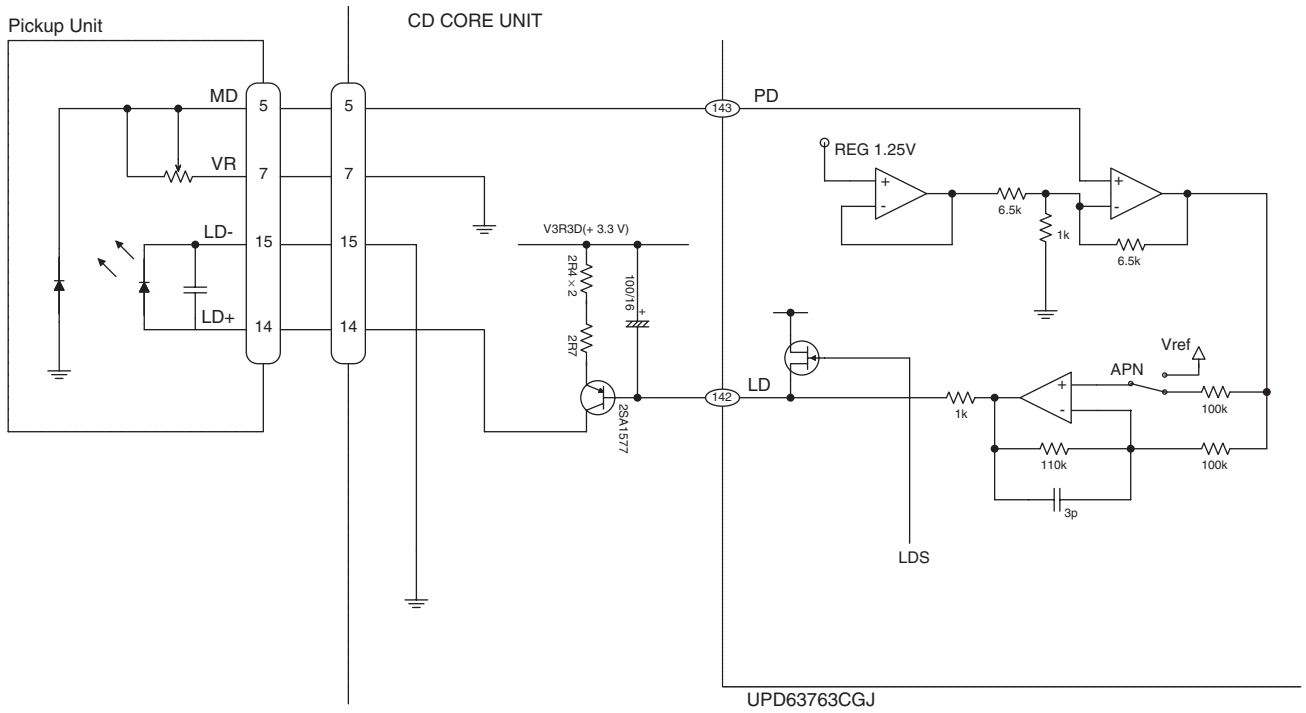


Fig.1.1.1 APC

1.1.2 RF and RFAGC amplifiers

The output from the photo-detector (A + C) and (B + D) is provided from the RFO terminal as the RF signal (which can be used for eye-pattern check), after it is added, amplified, and equalized inside this LSI. The low frequency component of the voltage RFO is calculated as below.

RFO = (A + B + C + D) x 2

The RFO is used for the FOK generation circuit and RF offset adjustment circuit.

The RFO signal, output from the pin 119, is A/C-coupled externally, input to the pin 118, and amplified in the RFAGC amplifier to obtain the RFAGC signal.

Also, this LSI is equipped with the RFAGC auto-adjustment function, explained below, which switches feedback gains of the RFAGC amplifier so that the RFO output will be 1.5 V.

This RFO signal is also used for the EFM, DFCT, MIRR, and RFAGC auto-adjustment circuits.

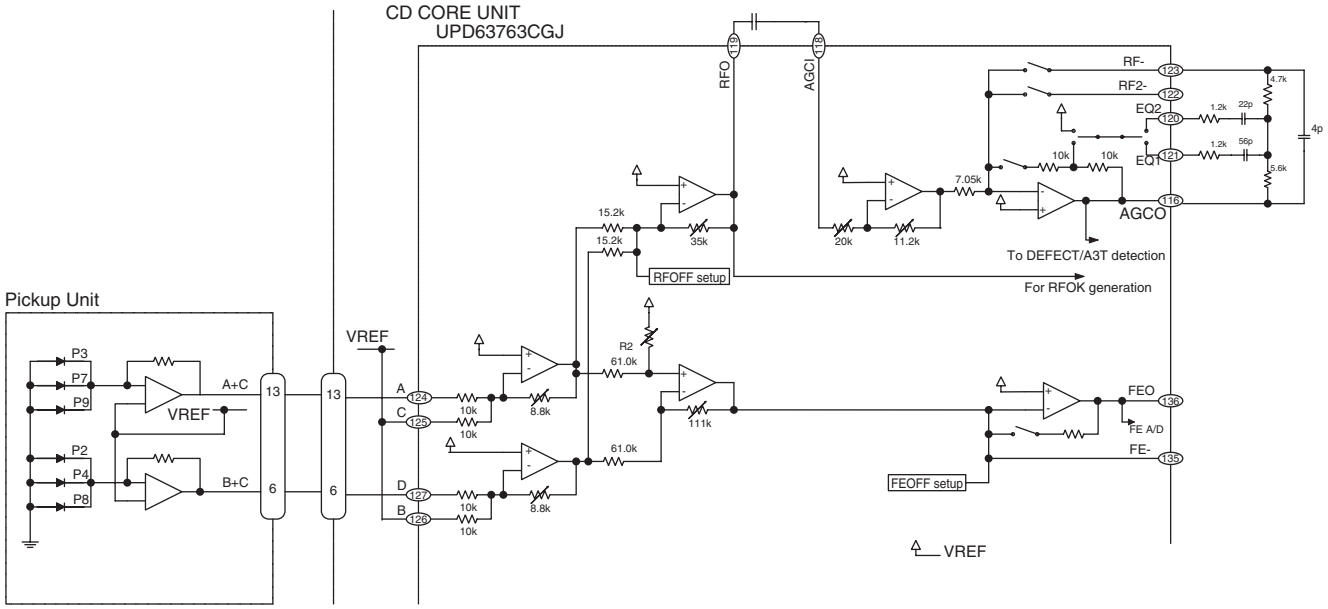


Fig.1.1.2 RF/AGC/FE

1.1.3 Focus error amplifier

The photo-detector outputs (A + C) and (B + D) are passed through the differential amplifier and the error amplifier, and (A + C - B - D) is provided from the pin 136 as the FE signal. The low frequency component of the voltage FE is calculated as below.

FE = (A + C - B - D) x 8.8k / 10k x 111k / 61k x 160k / 72k

= (A + C - B - D) x 3.5

For the FE outputs, an S-shaped curve of 1.5 Vp-p is obtained with the REFO as the reference. The cutoff frequency for the subsequent stage amplifiers is 14.6 kHz.

1.1.4 RFOK circuit

This circuit generates the RFOK signal, which indicates the timing to close the focus loop and focus-close status during the play mode, from the pin 55. As for the signal, "H" is output in closing the focus loop and during the play mode.

Additionally, the RFOK becomes "H" even in a non-pit area, since the DC level of the RFO signal is peak-held in the subsequent digital block and compared at a certain threshold level to generate the RFOK signal. Therefore, the focus is closed even on a mirror-surface area of a disc. This signal is also supplied to the microcomputer via the low-pass filer as the FOK signal, which is used for protection and gain switching of the RF amplifier.

1.1.5 Tracking error amplifier

The photo-detector outputs E and F are passed through the differential amplifier and the error amplifier to obtain (E - F), and then provided from the pin 139 as the TE signal. The low frequency component of the voltage TE is calculated as below.

TEO = (E - F) x 63k / 112k x 160k / 160k x 181k / 45.4k x 160k / 80k

= (E - F) x 4.48

For the TE output, TE waveform of about 1.3 Vp-p with the REFO as the reference. The cutoff frequency in the subsequent is 21.1 kHz.

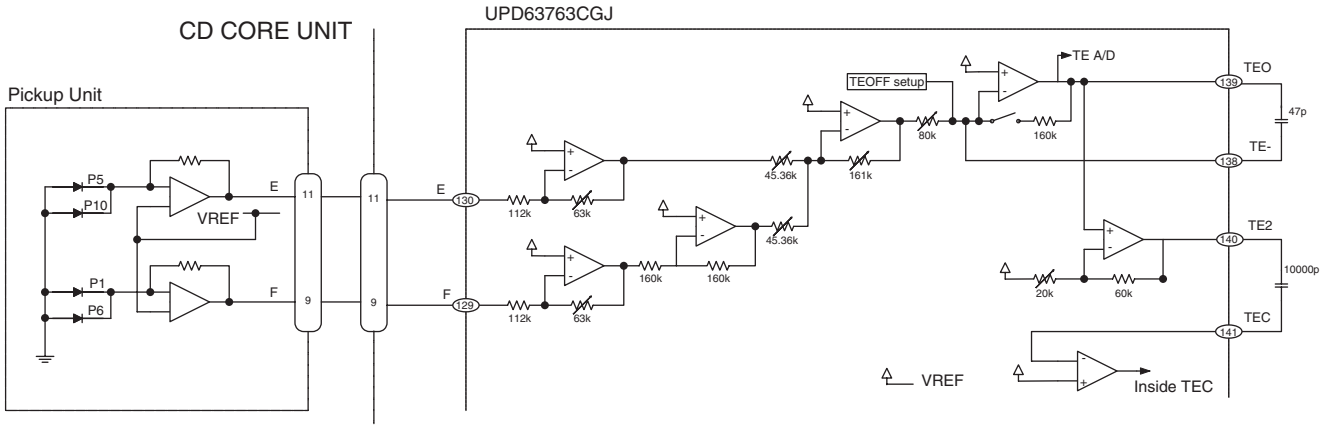


Fig.1.1.3 TE

1.1.6 Tracking zero-cross amplifier

The tracking zero-cross signal (hereinafter referred to as TEC signal) is obtained by amplifying the TE signal by fourfold, and used to detect the tracking-error zero-cross point. As the purpose of detecting the zero-cross point, the following two points can be named:

1. To use for track-counting in the carriage move and track jump modes
2. To use for detecting the direction in which the lens moves in tracking close. (Used in the tracking brake circuit to be explained later.)

The frequency range of the TEC signal is from 300 Hz to 20 kHz, and

TEC voltage = TE level x 4

The TEC level can be calculated at 4.62 V, which, at this level, exceeds the D range of the operational amplifier, and clips the signal, but, because the CD LSI only uses the signal at the zero-cross point, it poses no particular problem.

1.1.7 EFM circuit

The EFM circuit converts the RF signal into digital signals of 0 and 1. The AGCO signal output from the pin 116 is A/C-coupled externally, input to the pin 114, and supplied to the EFM circuit.

Missing RF signal due to scratches and stains on the disc, and asymmetry of the upper and lower parts of the RF, caused by variation in disc production, cannot be entirely eliminated in AC coupling process, the reference voltage ASY of the EFM comparator is controlled, using the probability that 0 and 1 occur at 50%. Thus, the comparator level will always stay around the center of the RFO signal. This reference voltage ASY is generated by passing the EFM comparator output through the low-pass filter. The EFM signal is output from the pin 111.

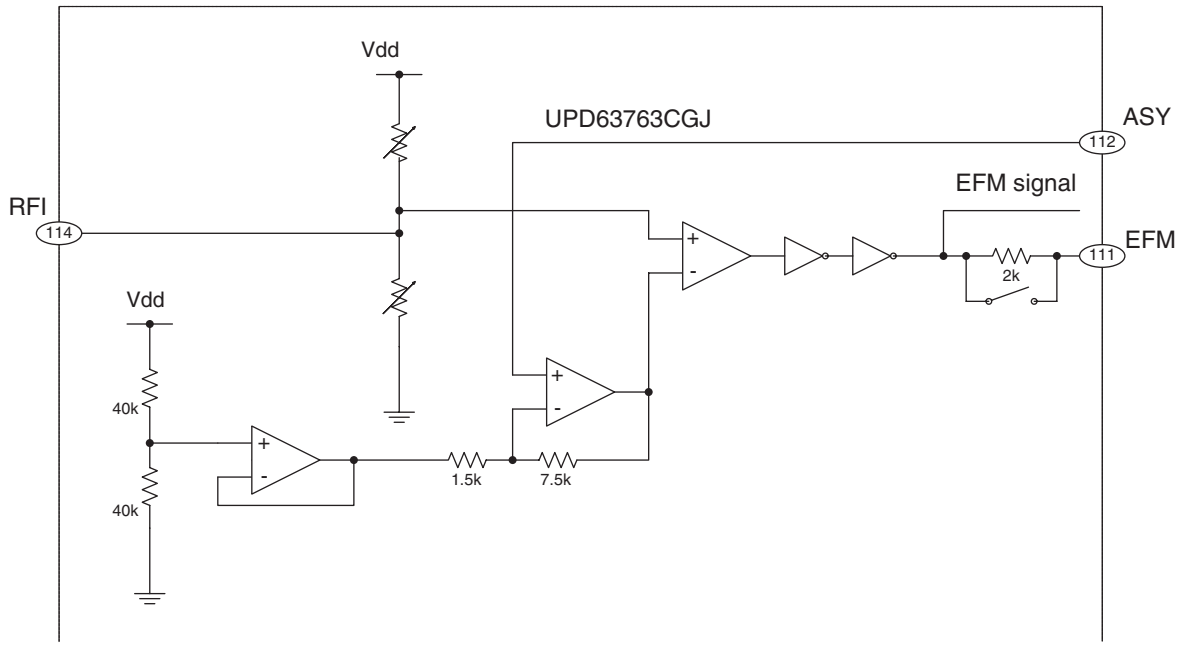


Fig.1.1.4 EFM

1.2 SERVO BLOCK (UPD63763CGJ: IC201)

The servo block performs servo control such as error signal equalizing, in-focus, track jump and carriage move. The DSP block is the signal-processing unit, where data decoding, error correction, and compensation are performed. The FE and TE signals, generated in the preamplifier stage, are A/D-converted, and output drive signals for the focus, tracking, and carriage systems via the servo block. Also, the EFM signal is decoded in the signal-processing unit, and ends up in outputting D/A-converted audio signals through the D/A converter. Furthermore, in this decoding process, the spindle servo error signal is generated, supplied to the spindle servo block, and used to output the spindle drive signal.

Each drive signal for focus, tracking, carriage, and spindle servos (FD, TD, SD, and MD) are output as PWM3 data, and then converted to analog data through the LPF. These drive signals, after changed to analog form, can be monitored with the FIN, TIN, CIN, and SIN signals, respectively. Subsequently, the signals are amplified and supplied to the actuator and motor for each signal.

1.2.1 Focus servo system

The main equalizer of the focus servo consists of the digital equalizer block. The figure 1.2.1 shows the block diagram of the focus servo system.

In the focus servo system, it is necessary to move the lens within the in-focus range in order to close the focus loop. For that purpose, the in-focus point is looked for by moving the lens up and down with the focus search voltage of triangular signal. During this time, the rotation of the spindle motor is retained at a certain set speed by kicking the spindle motor.

The servo LSI monitors the FE and RFOK signals and automatically performs the focus-close operations at an appropriate timing. The focus-close operation is performed when the following three conditions are satisfied at the same time:

1) The lens moves toward the disc surface.
2) RFOK = "H"
3) The FE signal is zero-crossed.

Consequently, the FE converges to "0" (= REFO).

When the above-mentioned conditions are met and the focus loop is closed, the FSS bit is shifted from "H" to "L," and then, in 10 ms, the microcomputer starts monitoring the RFOK signal obtained through the low-pass filter.

If the RFOK signal is determined to be "L," the microcomputer takes several actions including protection.

Fig.1.2.2 shows a series of actions concerning the focus close operations. (It shows a case where the focus loop cannot be closed.)

With the focus mode selector displaying 01 in the test mode, pressing the focus close button, allows to check the S-shaped curve, search voltage, and actual lens behavior.

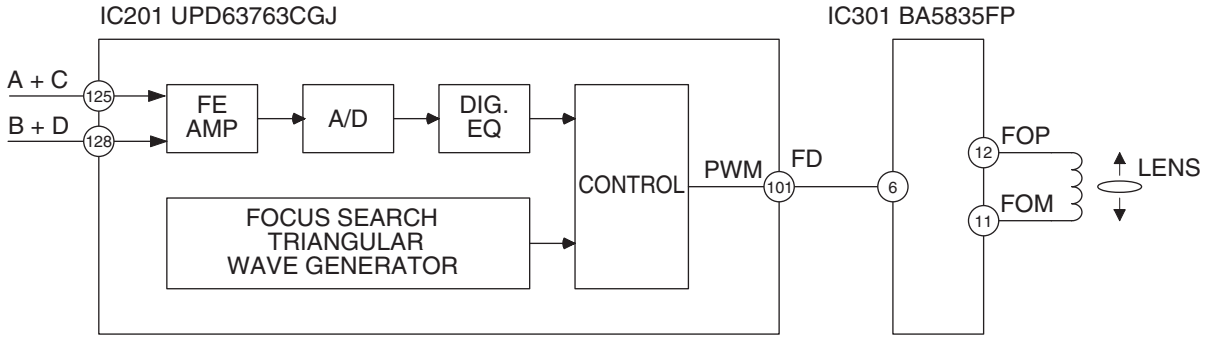


Fig.1.2.1 Block diagram of the focus servo system

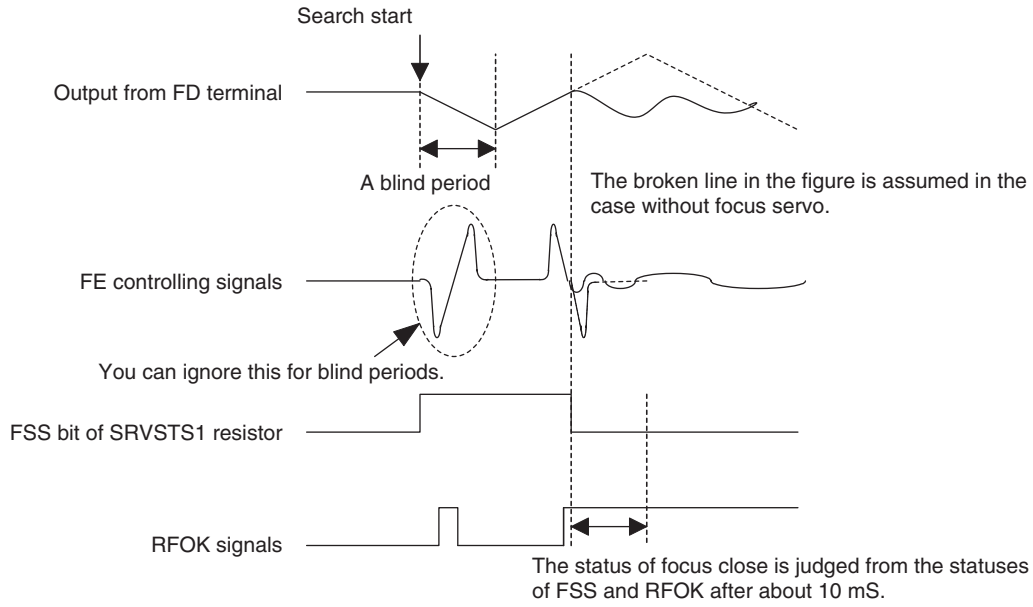

Search start
Output from FD terminal
A blind period
The broken line in the figure is assumed in the case without focus servo.
FE controlling signals
You can ignore this for blind periods.
FSS bit of SRVSTS1 resistor
RFOK signals
The status of focus close is judged from the statuses of FSS and RFOK after about 10 mS.

Fig.1.2.2 Timing chart for focus close operations

1.2.2 Tracking servo system

The main equalizer of the tracking servo consists of the digital equalizer block. The figure 1.2.3 shows the block diagram of the tracking servo system.

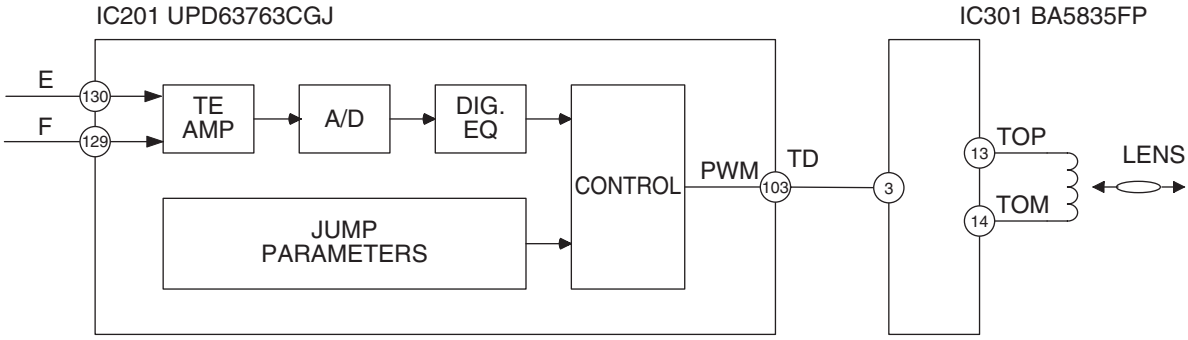


Fig.1.2.3 Block diagram of the tracking servo system

(a) The track jump operation is automatically performed by the auto-sequence function inside the LSI with a command from the microcomputer. For the track jumps used in the search mode, a single track jump and four to 100 multi-track jump are available in this system. In the test mode, out of these track jumps, 1, 32, and 32 * 3 track jumps, as well as carriage move can be performed and checked in mode selection. In a track jump, the microcomputer sets about half the number of the total tracks to jump (about five tracks for a 10-track jump), and the set number of tracks are counted using the TEC signal. By outputting the brake pulse for a certain period of time (set by the microcomputer) from the time the set number is counted, and stopping the lens, the tracking loop can be closed so that the normal play can be continued.

Also, in order to facilitate closing of the tracking loop in a track jump, the brake circuit is kept ON for 50 msec, after the brake pulse is stopped, for increasing the tracking servo gain. The FF/REW action in the normal operation mode is realized by performing single jumps consecutively. The speed is approximately 10 times faster than in the normal mode.

(b) Brake circuit

Since the servo loop is not closed very well in the setup mode and track jump mode, the brake circuit is used for stabilizing the servo-loop close operation. The brake circuit detects the direction in which the lens moves, and outputs only the drive signal for the direction opposite to the movement to slow down the lens, thereby stabilizing the tracking servo-loop close operation. Additionally, the off-track direction is determined from the TEC and MIRR signals, as well as their phase relation.

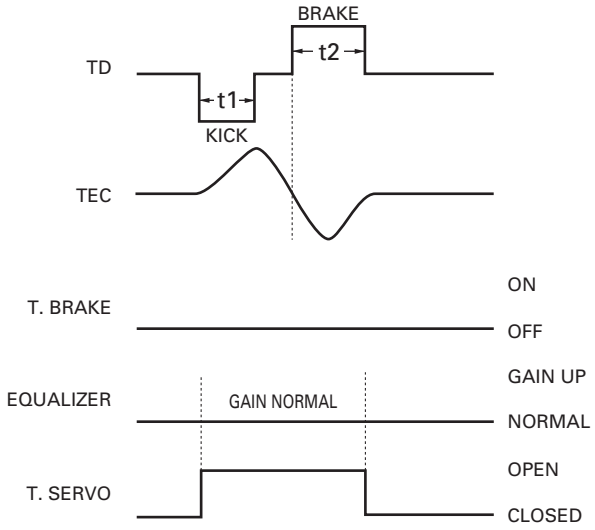


Fig.1.2.4 Single-track jump

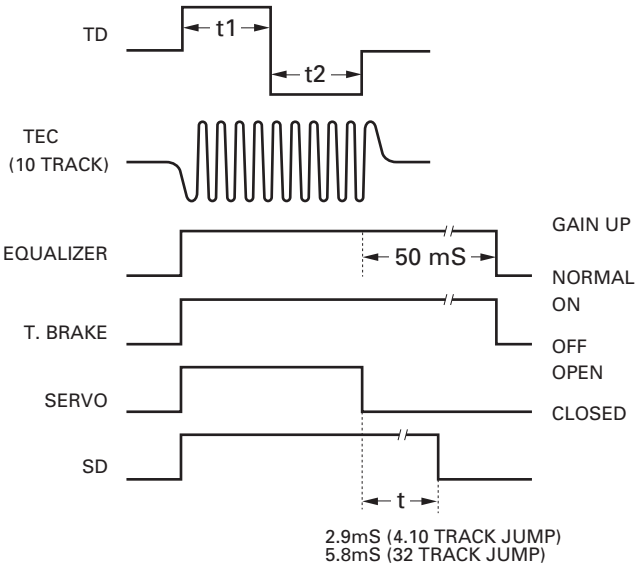
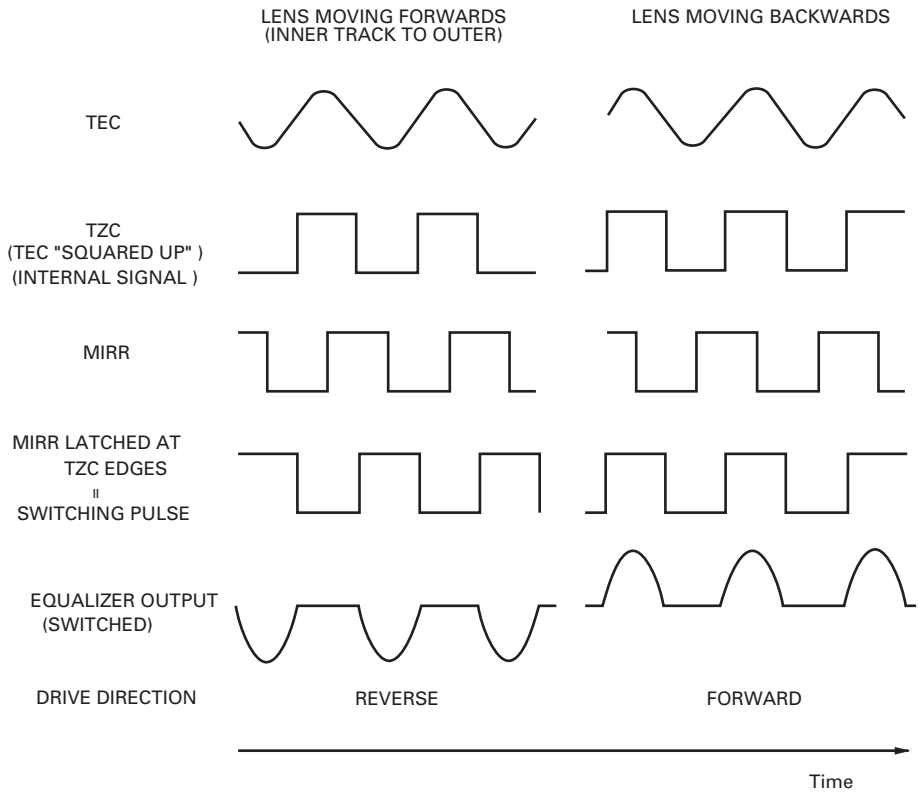


Fig.1.2.5 Multi-track jump



Note : Equalizer output assumed to hava same phase as TEC.

Fig.1.2.6 Track brake

1.2.3 Carriage servo system

The carriage servo system inputs the output of the low frequency component from the tracking equalizer (information on the lens position) to the carriage equalizer, and, after the gain is increased to a certain level, outputs the drive signal from the LSI. This signal is applied to the carriage motor via the driver IC.

Specifically, since it is necessary to move the whole pickup to the FORWARD direction when the lens offset reaches a certain level during the play mode, the equalizer gain is set to output higher voltage than the carriage motor starting voltage at this time. In actual operations, a certain threshold level is preset in the servo LSI for the equalizer output, and only when it exceeds the threshold level, the drive voltage will be output. This can reduce the power consumption. Also, before the whole pickup starts moving, the equalizer output voltage may exceed the threshold level a few times, due to such causes as eccentricity of discs. In this case, the output waveform of the drive voltage from the LSI assumes a pulse-like form.

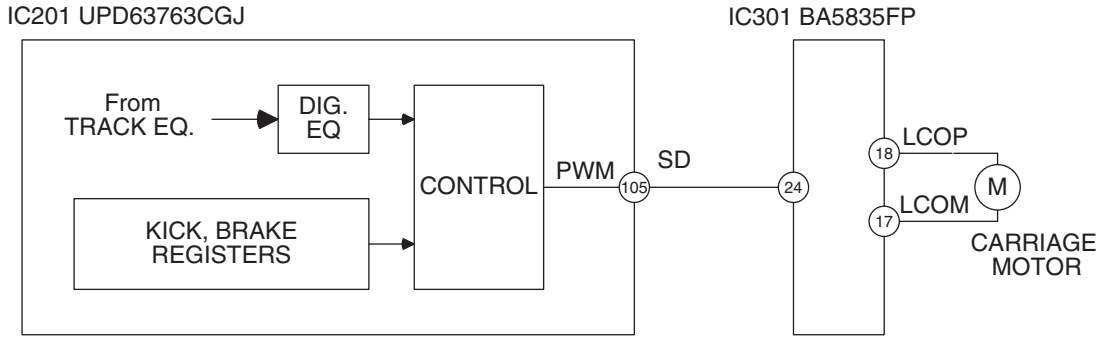


Fig.1.2.7 Block diagram for the carriage servo block

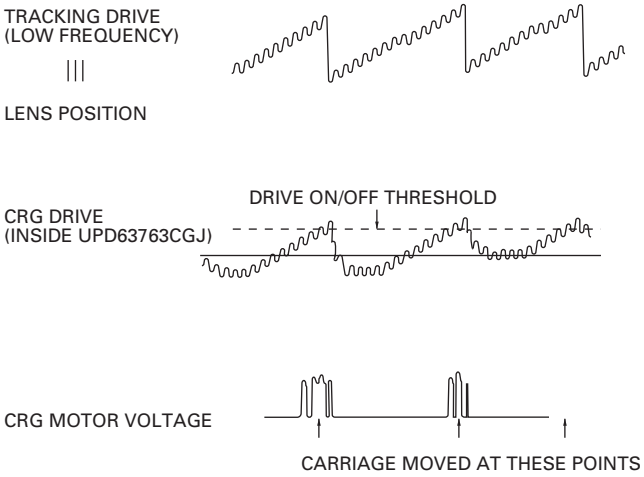


Fig.1.2.8 Waveforms of the carriage signal

1.2.4 Spindle servo system

In the spindle servo system, the following modes are available:

1) Kick

Used to accelerate the disc rotation in the setup mode.

2) Offset

a. Used in the setup mode after the kick mode, until the TBAL adjustment is completed.

b. Used during the play mode when the focus loop is unlocked, until it is locked again.

In both cases, the mode is used to keep the disc rotation approximately normal.

3) Applicable servo

CLV servo mode, used in the normal operation.

In the EFM demodulation block, by WFCK/16 sampling whether the frame sync signal and the internal frame counter output are synchronized, a signal is created to show if they are "in-sync" or "non-sync." The status is not recognized as asynchronous until the signal is "non-sync" for eight consecutive times; otherwise it is recognized as synchronous. In the applicable servo mode, the leading-in servo mode is automatically selected in the asynchronous status, and the normal servo mode in the synchronous status.

4) Brake

Used to stop the spindle motor.

In accordance with the microcomputer's command, the brake voltage is sent out from the servo LSI. At this time, the EFM waveform is monitored in the LSI, and when the longest EFM pattern exceeds a certain interval (or the rotation slows down enough), a flag is set inside the LSI, and the microcomputer switches off the brake voltage. If a flag is not set within a certain period, the microcomputer shifts the mode from the brake mode to the stop mode, and retains the mode for a certain period of time. If the mode switches to this stop mode in the eject operation, the disc will be ejected after the period of time mentioned above elapses.

5) Stop

Used when the power is turned on and during the eject operation. In the stop mode, the voltage in both ends of the spindle motor is 0 V.

6) Rough servo

Used in carriage feed (carriage move mode such as long search).

By obtaining the linear velocity from the EFM waveform, the "H" or "L" level is input to the spindle equalizer. In the test mode, this mode is also used for grating confirmation.

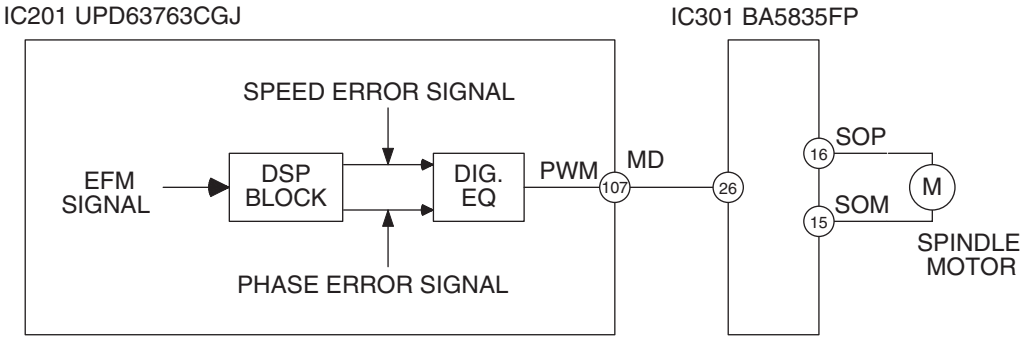


Fig.1.2.9 Block diagram of the spindle servo system

1.3 AUTOMATIC ADJUSTMENT FUNCTION

In this system, all the circuit adjustments are automated inside the CD LSI.
All adjustments are performed whenever a disc is inserted or the CD mode is selected by pressing the source key.
Details of each adjustment will be explained below.

1.3.1 TE, FE, and RF offset auto-adjustment

In this adjustment the TE, FE, and RF amplifier offsets of the preamplifier block in POWER ON are adjusted to the respective target values with the REFO as reference. (The target values for TE, FE, and RF offsets are 0 V, 0 V, and - 0.8 V, respectively.)
Adjusting procedure
1) The microcomputer reads respective offsets through the servo LSI, when they are in LDOFF status.
2) The microcomputer calculates the voltages for correction from the values read in 1), and substitutes the corrected values to prescribed places to adjust.

1.3.2 Tracking balance (T.BAL) auto-adjustment

This adjustment equalizes the output difference of the E-ch and F-ch from the pickup by changing the amplifier gain inside the LSI. In actual operation, adjustment is performed so that the TE waveform becomes symmetrical on each side of the REFO.
Adjusting procedure
1) After closing the focus loop,
2) Kick the lens in the radial direction to ensure the generation of the TE waveform.
3) The microcomputer reads the offset amount of the TE signal calculated in the LSI at the time through the servo LSI.
4) The microcomputer determines the offset amount is 0, positive, or negative.
- When the offset amount is 0, the adjustment is completed.
- When the offset amount is positive or negative, the amp gains for E-ch and F-ch should be changed, following a certain rule.
Then, steps 2) to 4) are repeated until the offset amount becomes 0 or the repetition reaches the limit number of times.

1.3.3 FE bias auto-adjustment

This adjustment is to maximizes the RFO level by optimizing the focus point during the play mode, utilizing the phase difference between the 3T level waveform of the RF waveform and that of when focus error disturbance is input. This adjustment is performed at the same timing as the auto-gain control, which will be described later, since disturbance is input to the focus loop.
Adjusting procedure
1) The microcomputer issues the command to introduce disturbance to the focus loop (inside the servo LSI).
2) The waver of the 3T component of the RF signal is detected in the LSI.
3) The relation between the 3T component above and the disturbance is processed inside the LSI to detect the volume and direction of the focus offset.
4) The microcomputer issues a command and reads out the detected results from the servo LSI.
5) The microcomputer calculates the necessary correction and substitutes the result to the bias adjustment term inside the servo LSI.
Additionally, in this adjusting, a series of steps are repeated for better adjustment accuracy, the same as in the auto-gain control.

1.3.4 Focus and tracking AGC

This adjustment is to automatically adjust the focus and tracking servo loop gains.

Adjusting procedure

1) Introduce disturbance to the servo loop.

2) The error signals (FE and TE) when disturbance is introduced are extracted through the band pass filter, to obtain the G1 and G2 signals.

3) The microcomputer reads the G1 and G2 signals through the servo LSI.

4) The microcomputer calculates the necessary correction and performs the loop gain adjustment inside the servo LSI.

For increased adjustment accuracy, the same adjustment process is repeated a few times.

1.3.5 RF level auto-adjustment (RFAGC)

This adjustment is to adjust the dispersion of the RF level (RFO), which may be caused by mechanism or disc-related factors, to a steady value for reliable signal transmission. The adjustment is performed by changing the amp gain between RFO and RFAGC.

Adjusting procedure

1) The microcomputer issues a command and reads out the output from the RF level detection circuit inside the servo LSI.

2) From the read values, the microcomputer calculates the amp gain to change the RFAGC level to the target.

3) The microcomputer sends a command to the servo LSI to adjust the amp gain to the level calculated in 2).

This adjustment is performed

1) when only the focus close operation is completed during the setup mode, and

2) immediately before the setup is completed (or when the play mode is about to start).

1.3.6 Adjustment of gains in preamplifier stage

In this adjustment, when reflected beams from the disc surface are extremely weak, such as when the lens is dirty, or a CD-RW is played, gains in the whole RFAMP block (FE, TE, and RF amplifiers) are increased by + 6 dB or + 12 dB, depending on the situation.

Adjusting procedure

When the system determines that the reflected beams from the disc surface are extremely weak during the setup mode, the whole RFAMP gains will be increased by + 6 dB or + 12 dB.

1.3.7 Initial values in adjustment

All automatic adjustments immediately after inserting a disc are performed based on the initial values. Automatic adjustments by source change or ACC ON are basically performed using the previous adjustment values as the initial values.

1.3.8 Coefficient display of adjustment results

For some of the adjustments (FE and RF offset, FZD cancel, F and T gains, and RFAGC), the adjustment results can be displayed and confirmed in the test mode.

The coefficient display in each auto adjustment is as follows:

1) FE and RF offset

Reference value = 32 (coefficient of 32 indicates that no adjustment is required)

The value is displayed in the unit of approximately 32mV.

Ex. When the FE offset coefficient is 35,

35 - 32 = 3 x 32 mV = 96 mV

The correction is about +96 mV, which means the FE offset before adjustment is - 96 mV.

2) F and T gain adjustment

Reference value for focus and tracking = 20

The displayed coefficient / the reference value indicates the adjusted gain.

Ex. When the AGC coefficient is 40,

adjustment of 40 / 20 = 2 times (+ 6 dB) has been performed.

(It means that the original loop gain was half the target, and the whole gain was doubled to obtain the target value.)

3) RF level adjustment (RFAGC)

Reference value = 8

The coefficient of 9 to 15 indicates to increase the RF level

(for more gains).

The coefficient of 7 to 10 indicates to decrease the RF level

(for less gains).

When the coefficient changes by 1, the gain changes by 0.7 to 1 dB.

When the coefficient is 15, the gain is the maximum at TYP + 7.9 dB.

When the coefficient is 0, the gain is the minimum at TYP - 4.6 dB.

1.4 POWER SUPPLY AND LOADING BLOCK

For the power supply for this system, the VD (7.5 ± 0.5 V) and the VDD (5.0 ± 0.25 V), which are supplied from the motherboard, are used. The three power supplies, the VD mentioned above (for the drive system), the V3R3D obtained from the VD via the 3.3 V regulator (for the control system: 3.3 V) and the VDD (for the microcomputer: 5 V), are used in this system.

The microcomputer controls ON/OFF with "CONT", except for Load/Eject of the CD driver, and ON/OFF of 3.3 V with "CD3VON". For ON/OFF of the Loading drive, no particular control terminals are available, but the input signal "LOEJ" assumes an equivalent role. Also, the LCO output switches LOADING MODE and CARRIAGE MODE with "CLCONT".

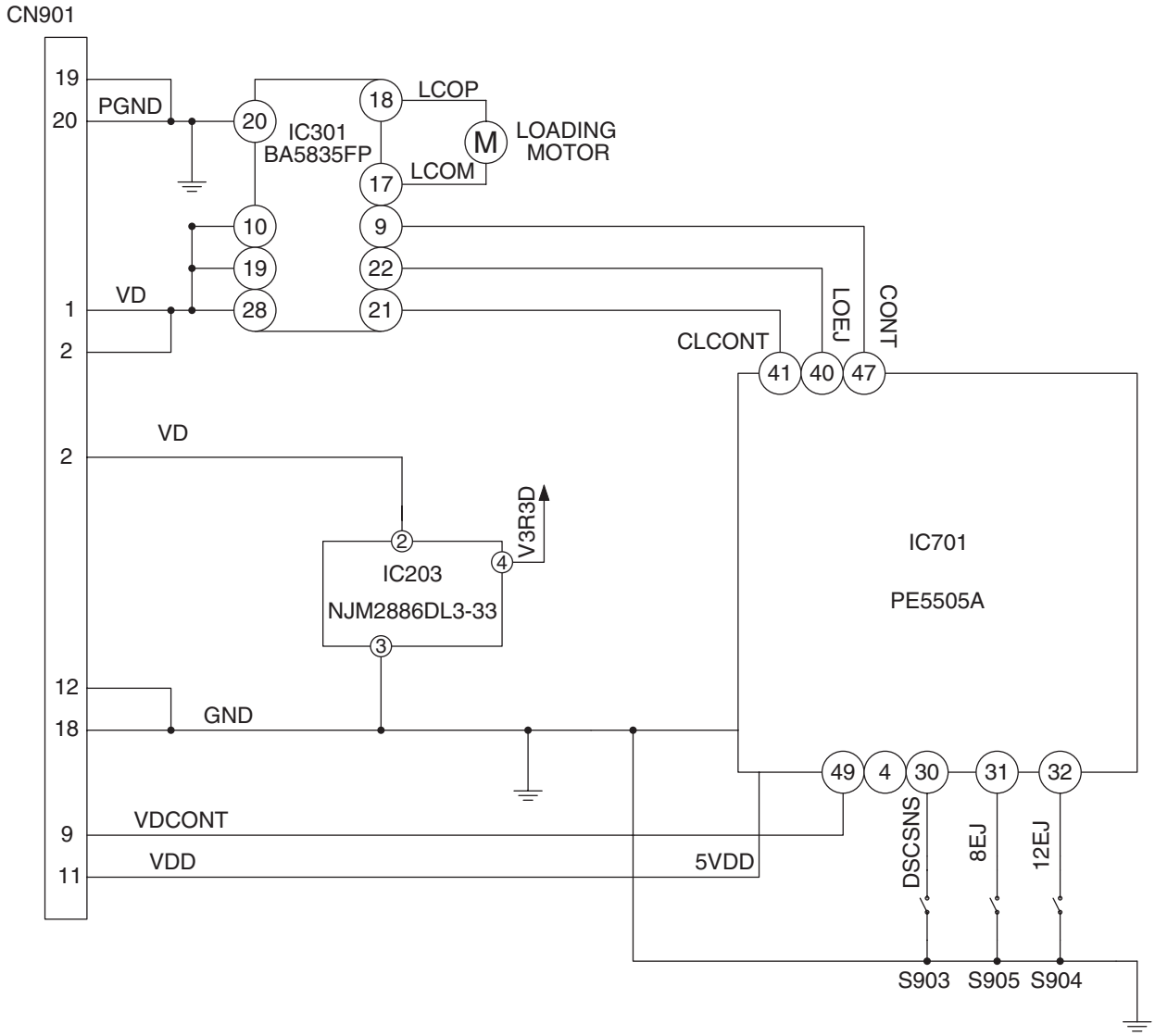


Fig.1.4.1 Power supply/loading system circuit block

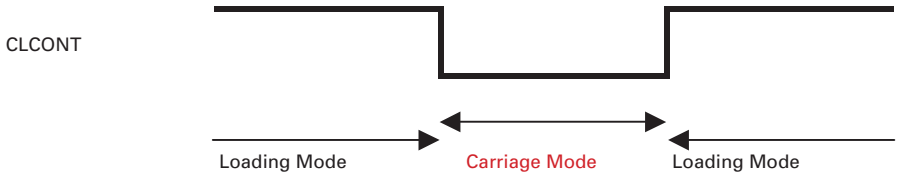


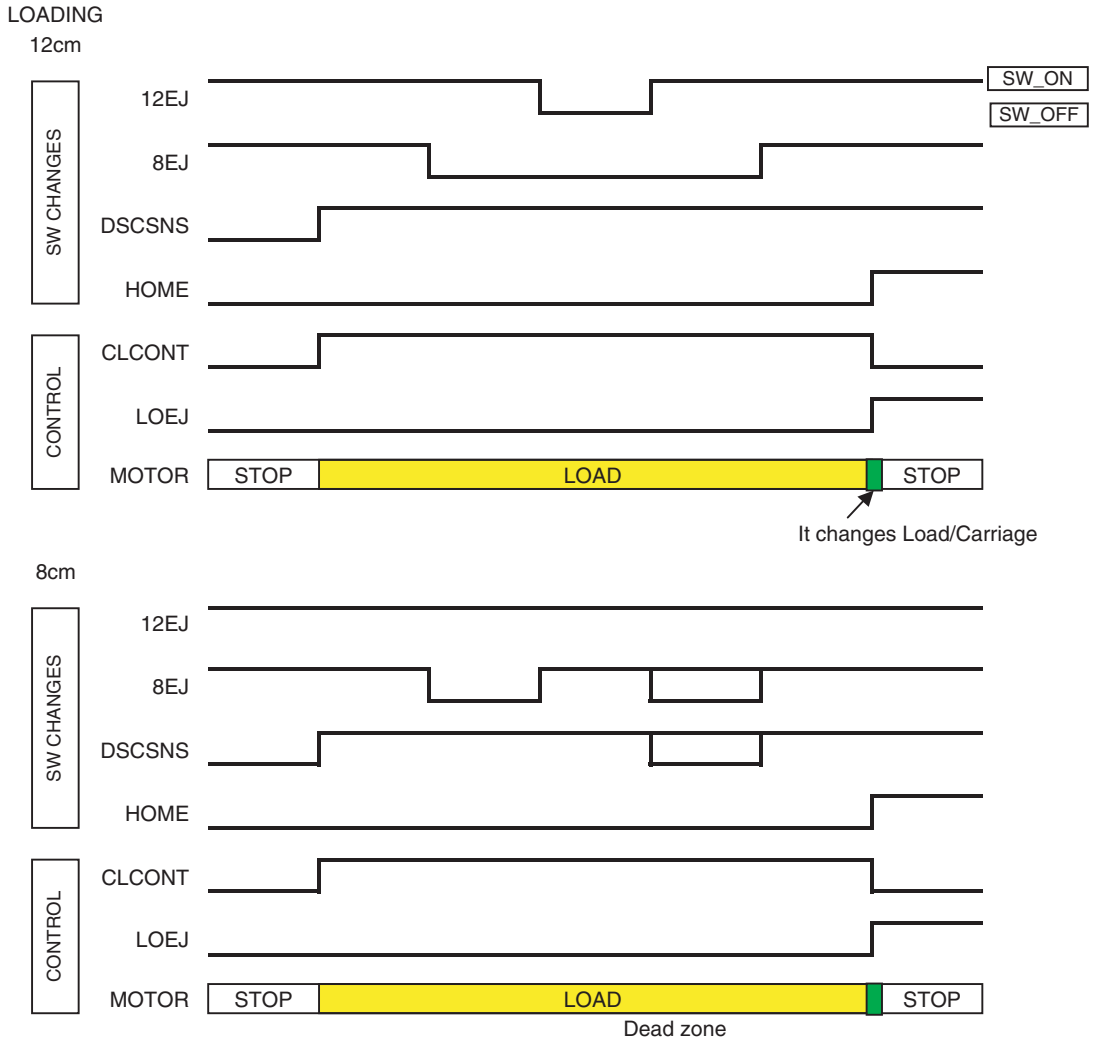
Fig.1.4.2 Loading/carriage mode shift

The load/eject operation is controlled with the status changes of the HOME switch (also used for clamp detection) on the mechanism unit and the three switches on the control unit. The ON/OFF statuses of these switches are respectively detected at the input port of the microcomputer.

Using the detection results in the microcomputer, each status (A to E) is determined. The disc size detection (8 or 12 cm) is also performed through this status change. Each status is shown in Fig.1.4.3 and the status change in Fig.1.4.4.

	Status	A	B	C	D	E
DSCSNS	SW1(S903)	OFF	ON	ON	ON	ON
8SW	SW2(S905)	ON	ON	OFF	OFF	ON
12SW	SW3(S904)	ON	ON	ON	OFF	ON
HOME	SW4(S901)	OFF	OFF	OFF	OFF	ON
	Mechanism state	With no disc				Clamp state

Fig.1.4.3 DSCSNS status



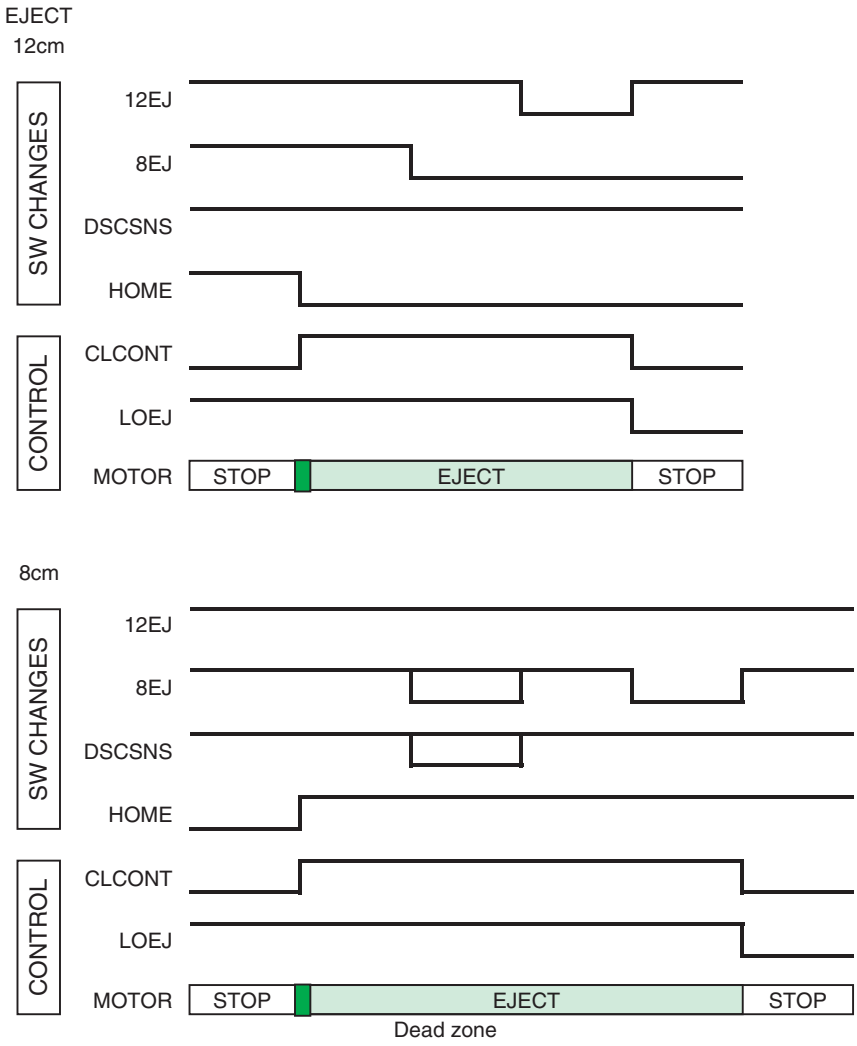
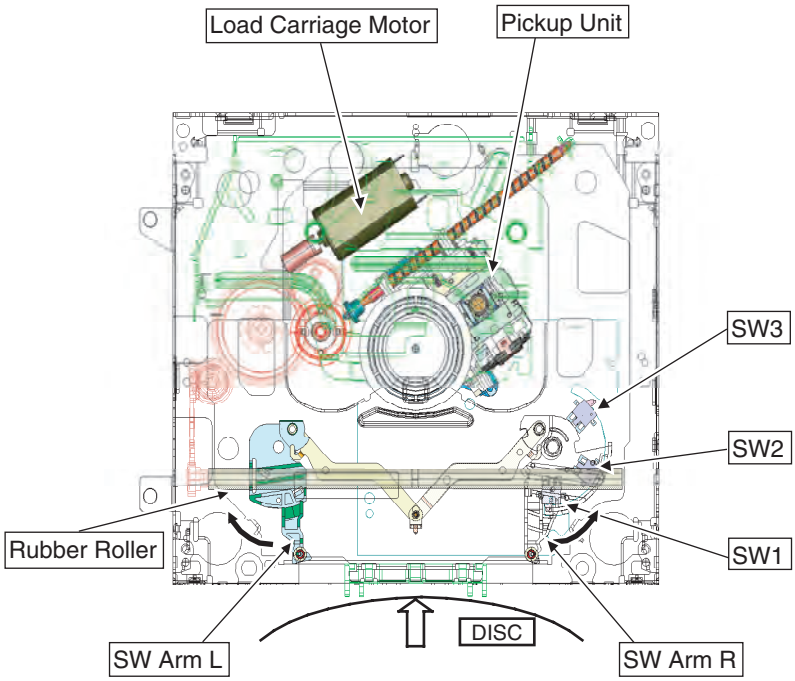


Fig.1.4.4 Status change in LOAD and EJECT modes

2. MECHANISM DESCRIPTIONS

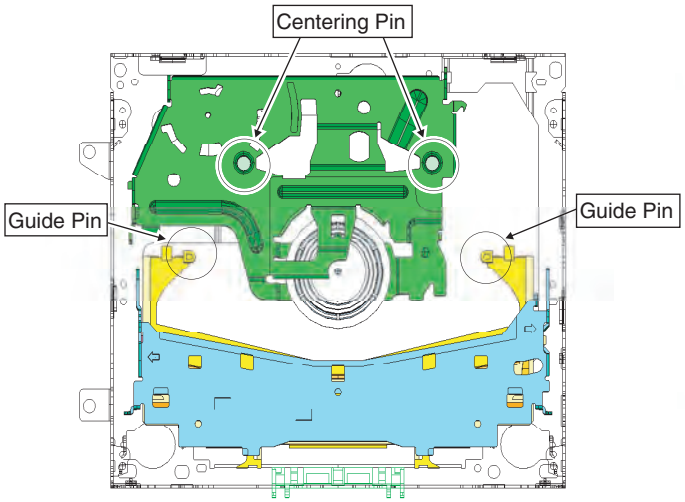
● Loading actions

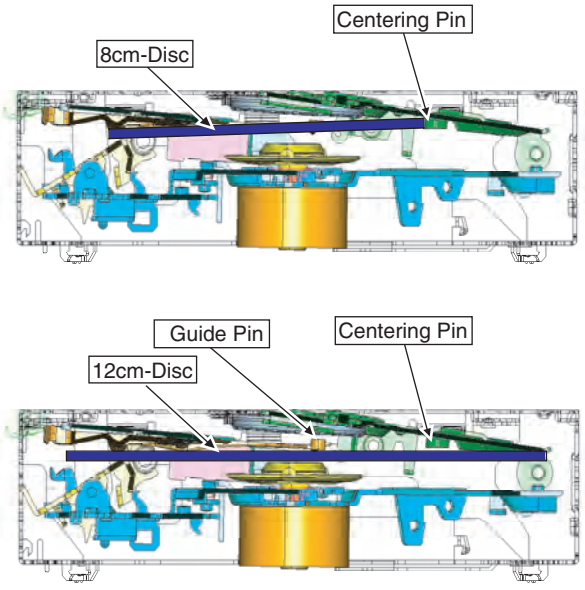
1. When a disc is inserted, SW Arm L and R rotate and SW1 is switched from ON to OFF.
   When SW1 is switched from ON to OFF, the Load Carriage Motor is started and the rubber roller rotates.
2. If the disc is a 12cm-disc, SW3 is turned ON with SW Arm, and the microcomputer determines that the disc is a 12cm-disc.
3. In case of an 8cm-disc, SW3 is not turned ON, a clamp action is triggered, and the microcomputer determines that the disc is an 8cm-disc.
   (The left and right of SW Arm are coupled, and when only one side is pushed, the coupled joint will lock, and the arms will not open more than a certain width (SW3 will not be turned ON).)



● Disc centering mechanism

1. 8cm-disc is centered by the Guide Pins and the Centering Pins.
2. 12cm-disc passes under the Guide Pins and the Centering Pins, and centered in the back position of the mechanism.





● Clamp actions mechanism

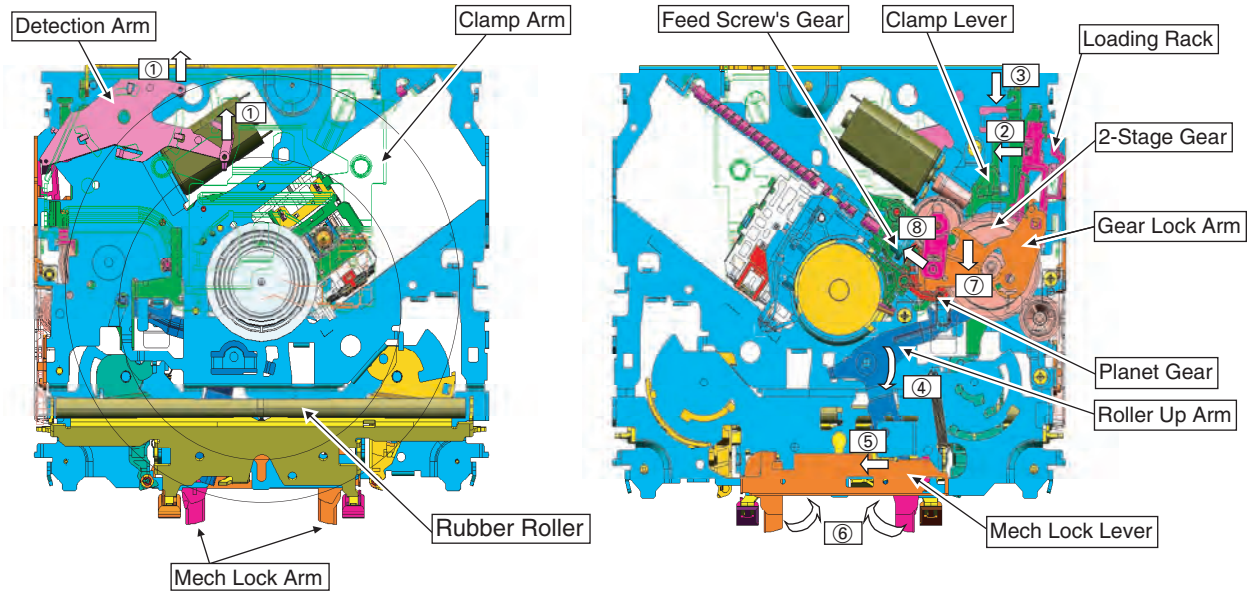
1. With an 8 or 12cm-disc centered on the spindle, the Detection Arm is moved.
2. The movement of the Detection Arm engages the Loading Rack with the 2-Stage Gear.
3. The Clamp Lever slides and lowers the Clamp Arm (the disc is clamped).

At the same time, the Roller Up Arm is rotated, and the Rubber Roller is separated from the disc.

Also the arm slides the Mechanical Lock Lever, turns the Mechanical Lock Arm, and releases the mechanical lock, completing the clamp operation.

4. When the clamp action is completed, the Clamp Lever rotates the Gear Lock Arm.

When the arm is rotated, the Planet Gear is separated from the 2-Stage Gear and engaged with the gear of the pickup feed screw, and the carriage operation will start



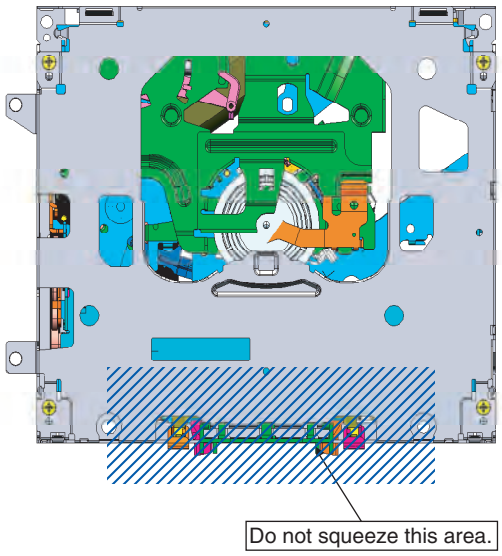
● Eject actions

1. When the Load Carriage Motor is rotated backward, and the pickup is fed to the inner periphery passing the home SW ON point, the eject action will start in the reverse order of the procedure mentioned earlier.
2. For a 12cm-disc, Eject is completed when SW3 is switched OFF, ON, and OFF again.
3. For an 8cm-disc, Eject is completed when SW2 is switched OFF, ON, and OFF again.

3. DISASSEMBLY

● How to hold the Mechanism Unit

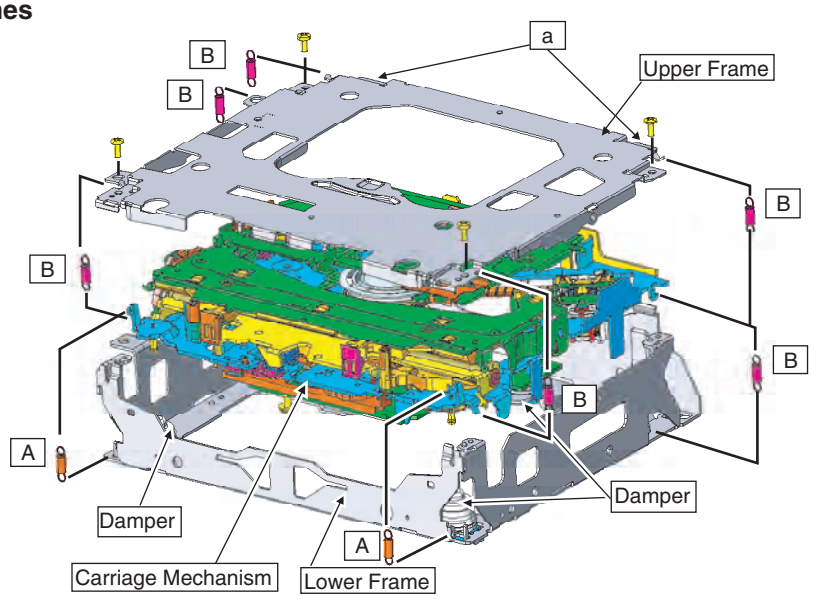
1. Hold the Upper and Lower Frames.
2. Do not hold the front portion of the Upper Frame, because it is not very solid.



● Removing the Upper and Lower Frames

1. With a disc inserted and clamped in the mechanism, remove the two Springs (A), the six Springs (B), and the four Screws.
2. Turn the Upper Frame using the part "a" as a pivot, and remove the Upper Frame.
3. While lifting the Carriage Mechanism, remove it from the three Dampers.

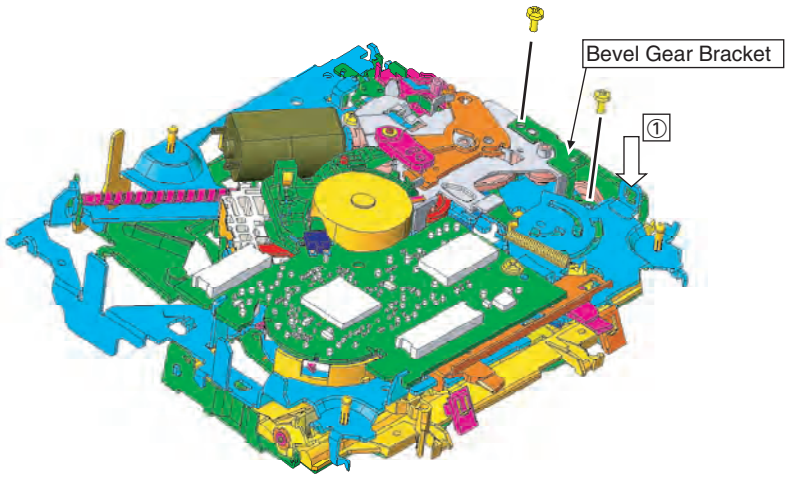
Caution: When assembling, be sure to apply some alcohol to the Dampers and assemble the mechanism in a clamped state.

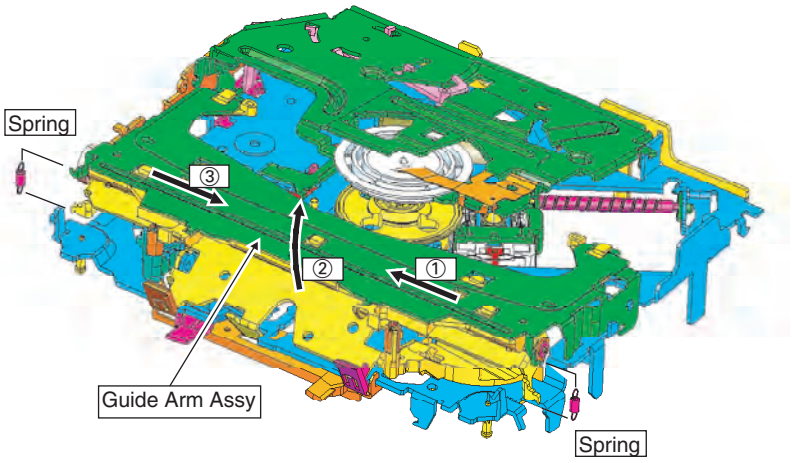


● Removing the Guide Arm Assy

1. Remove the Upper and Lower Frames and set the mechanism to the eject mode.
2. Remove the two Screws and Bevel Gear Bracket. (Note that the gears will come off.)
3. Remove the two Springs from the left and right sides.
4. Slide the Guide Arm Assy to the left, and turn it upward.
5. When it is turned about 45 degrees, slide it to the right and remove.

Caution: When assembling, assemble with the Bevel Gear Bracket moved to the direction of the arrow (①).

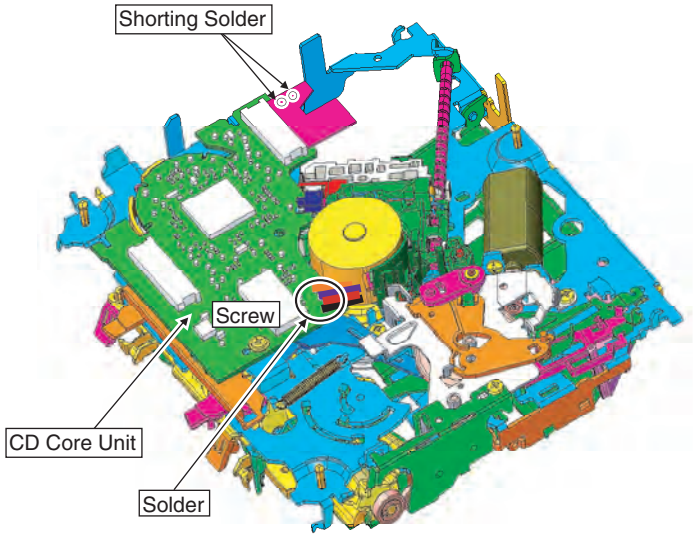




● How to remove the CD Core Unit

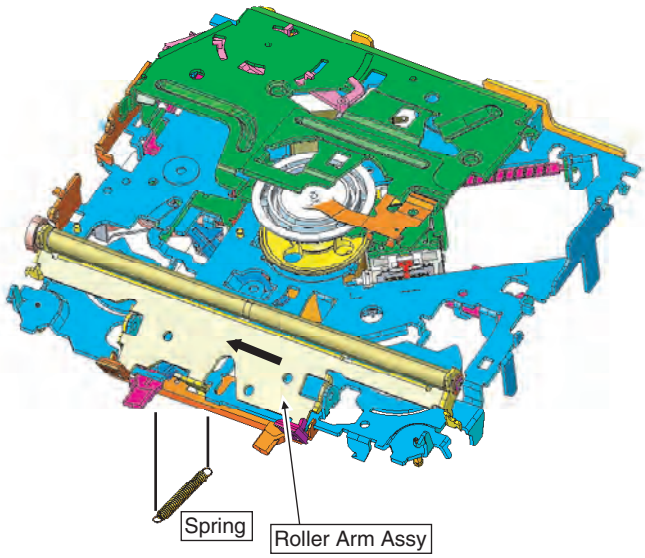
1. Apply Shorting Solder to the flexible cable of the Pickup, and disconnect it from the connector.
2. Unsolder the four leads, and loosen the Screw.
3. Remove the CD Core Unit.

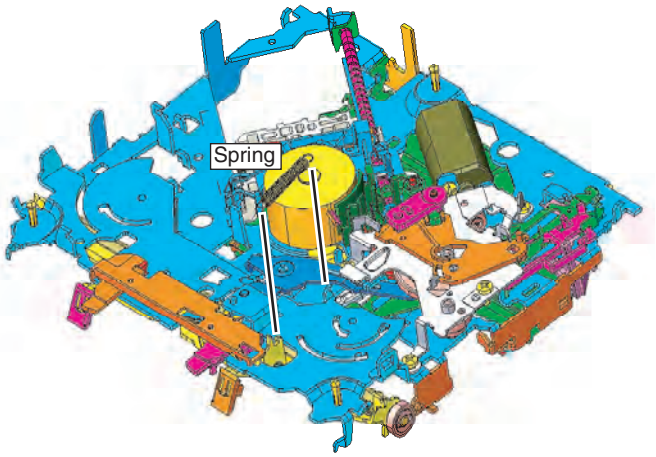
Caution: When assembling the CD Core Unit, assemble it with the SW in a clamped state so as not to damage it.



● How to remove the Roller Arm Assy

1. Remove the Guide Arm Assy.
2. Remove the CD Core Unit. (If the Spring can be removed, the unit need not be removed, depending on the type of CD Core Unit.)
3. Remove the Spring.
4. Slide the Roller Arm Assy to the left.



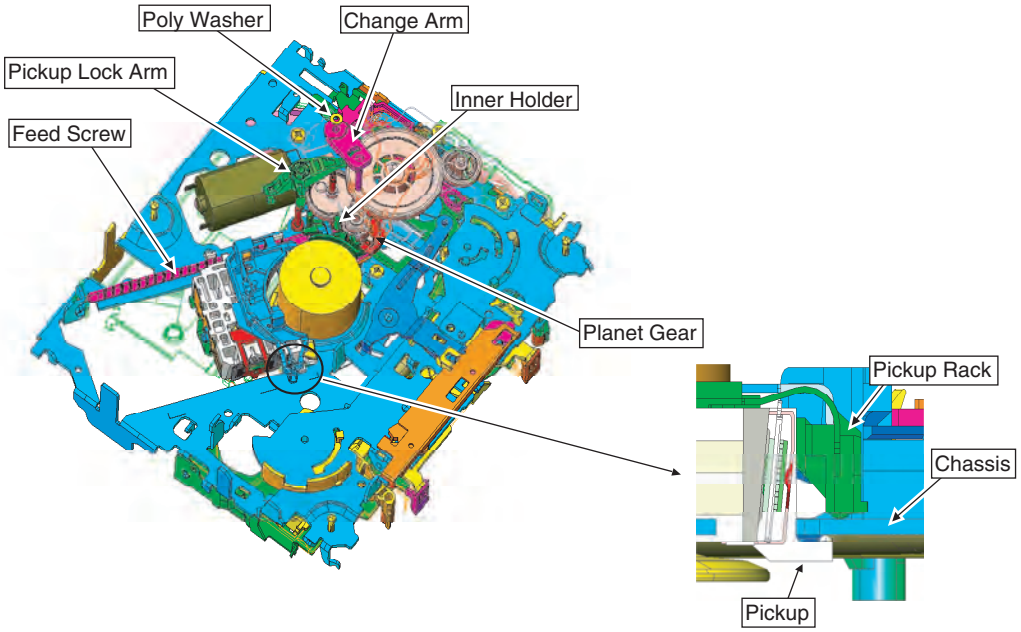


● How to remove the Pickup Unit

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Remove the CD Core Unit and remove the leads from the Inner Holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. While releasing from the hook of the Inner Holder, lift the end of the Feed Screw.

Caution: When assembling, move the Planet Gear to the load/eject position before setting the Feed Screw in the Inner Holder.

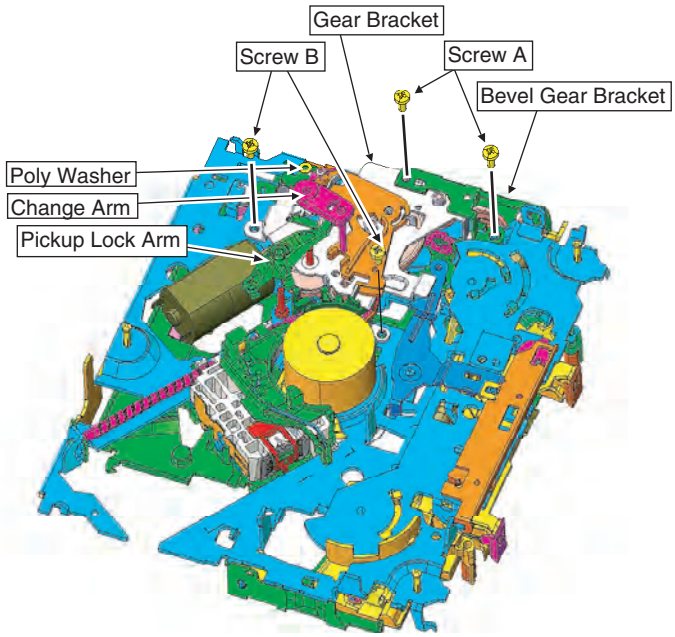
Assemble the sub unit side of the Pickup, taking the plate (Chassis) in-between. When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.

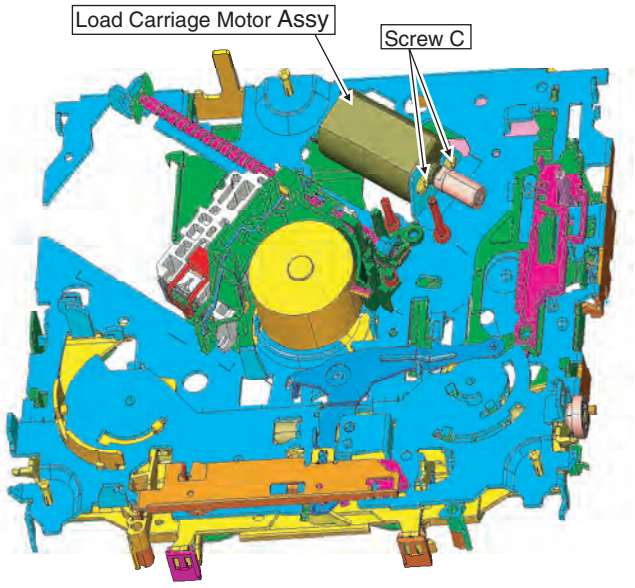


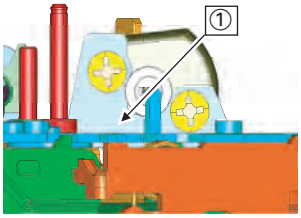
● How to remove the Load Carriage Motor Assy

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Release the leads (orange and purple) of Load Carriage Motor Assy from the CD Core Unit and remove the holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. Remove the two Screws (A) and the Bevel Gear Bracket (Note that the gears will come off).
5. Remove the two Screws (B) and the Gear Bracket (remove the CD Core Unit, if necessary), and remove all the gears.
6. Remove the two Screws (C) and the Load Carriage Motor Assy.

Caution: When assembling the Load Carriage Motor Assy, move it to the direction shown in the illustration (①).
When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.



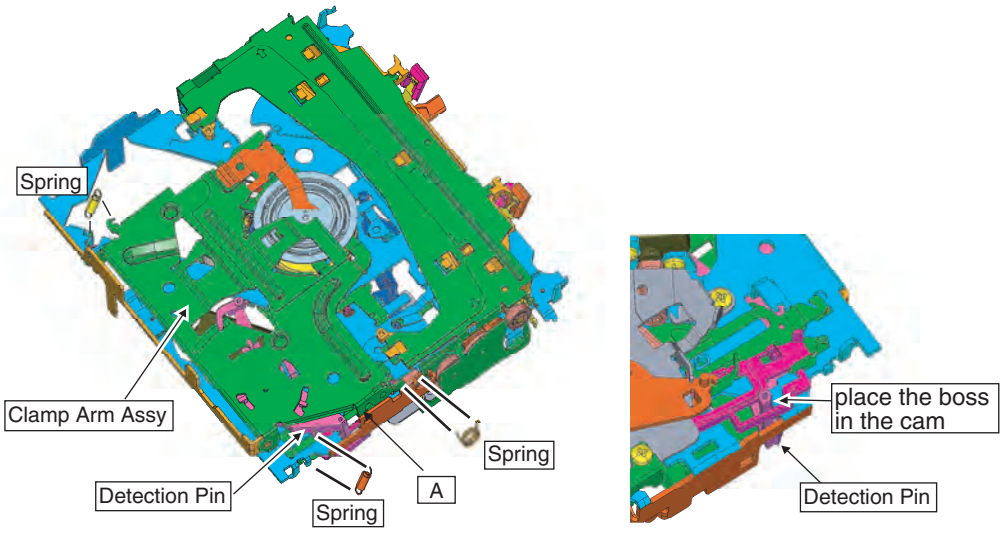




● How to remove the Clamp Arm Assy

1. Make the system in the carriage mechanism mode, and set the mechanism to the eject mode.
2. Remove the three Springs.
3. While pressing the position A, turn the Clamp Arm Assy upward, slide it to the left, and remove.

Caution: When assembling, place the boss of the Detection Pin in the cam unit of the Loading Rack.



● How to remove the Spindle Motor Assy

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Remove the CD Core Unit and remove the leads from the Inner Holder.
3. Set the mechanism to the eject mode and remove the Clamp Arm Assy.
4. Set the mechanism to the clamped and move the Pickup to circumference.
5. Remove the two Screws, and remove the Spindle Motor Assy.